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ABSTRACT

This second volume of the final report contains the statistical tables, coding key, and the rating manual for the coding key. Data on interrater reliability, factor analyses, and discriminant analyses are included and described. The manual for the coding key includes the data base and/or criteria for each item to be coded. (MNS)

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MATHEMATICS LEARNING VIEWED FROM A NEUROBIOLOGICAL MODEL FOR INTELLECTUAL FUNCTIONING

FINAL REPORT: VOLUME TWO

PATRICIA S. DAVIDSON

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— PRINCIPAL INVESTIGATOR —

Grant Number: NIE-79-0089
Project Number: 9-0087

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INTRODUCTION AND ACKNOWLEDGMENTS

This paper and the study it describes have been partially supported by grant G-79-0089 from the National Institute of Education, Teaching and Learning Program, with Patricia S. Davidson as Principal Investigator.

Other personnel associated with the project have been as follows:

Maria R. Marolda, Project Coordinator, Rater, Liaison with Children's Hospital Medical Center: Assistance in all aspects of the project and in the preparation of the final report.

Richard Truesdell, Statistical and Computer Consultant: Assistance in the statistical planning, execution, and analyses; and in the preparation of Section IX of the final report.

Paul A. Klein, Research Design Consultant: Assistance in the statistical research design, coordination, overview, and data interpretation; and in the preparation of the Reliability Study, Section IX, A.1 of the final report.

Joan Crooker, Research Assistant: Assistance in obtaining data from the hospital records and in the formation of independent files on each of the 220 subjects.

Ruth Marsal, Technical Secretary: Typing, art work and manuscript preparation for all aspects of the project and final report.

Special thanks go to each of the team members and also to the staff members of the Learning Disabilities Clinic, Department of Neurology, Children's Hospital Medical Center, Boston, Massachusetts for their help and cooperation: in particular, Martha Bridge Denckla, M.D. (Neurologist), director of the clinic during the three-year period, 1977-1979, in which the subjects being studied were tested; H.Harris Funkenstein, M.D. (Neurologist), current director of the clinic; and Jane Holmes, Ph.D., Neuropsychologist of the clinic.

Vital to this entire study are the children who have been evaluated over the past seven years with evolving versions of the mathematics diagnostic activities presented here. These close interactions with over 1,200 children, ages 5-18, together with the collaboration with the entire medical/educational

team also involved in the evaluation and discussion of the same children from their own specialized viewpoints (neurology, neuropsychology, psychiatry, audiology, speech and language, and reading) have been invaluable.

This final report is organized into eleven sections with Sections I - VIII bound in Volume I and Sections IX - XI bound in Volume II.

VOLUME I

Section I:	Purpose of Study: Description and Rationale
Section II:	Methods Used in the Study
Section III:	Results and Findings
Section IV:	Implications
Section V:	Prescriptive Teaching
Section VI:	Dissemination
Section VII:	Pedagogical Suggestions for Remediation and Enrichment
Section VIII:	Bibliography of Research on the Brain and Intellectual Functioning

VOLUME II

Section IX:	Statistical Analyses of Research Study
Section X:	Coding Key
Section XI:	Rating Manual for Coding Key

The author of this paper assumed responsibility for the overall directions of the project. All statements and interpretations presented herein are the author's and do not mean to suppose or suggest policies or beliefs of anyone else associated with the project, the University of Massachusetts, the National Institute of Education, or the Children's Hospital Medical Center.

MATHEMATICS LEARNING
VIEWED FROM A NEUROBIOLOGICAL MODEL
FOR INTELLECTUAL FUNCTIONING

by

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ABSTRACT

During the past seven years, clinical and statistical observations have pursued answers to the following questions:

(1) Can individuals be classifed according to specific learning styles in mathematics?

(2) Can specific learning styles in mathematics be defined by such factors as facility with particular mathematics topics or skills, ease with particular kinds of mathematical stimuli, style of processing, and effectiveness within different mathematical contexts?

(3) Are specific learning styles in mathematics associated with localized hemispheric functioning of the brain?

(4) Can teaching strategies be developed to respond to different learning styles?

The Mathematics Diagnostic/Prescriptive Inventory (MDPI), an individualized mathematics evaluation instrument assessing achievement, ability and learning style in mathematics, has been administered to over 1,200 children, ages 5 to 18, at the Learning Disabilities Clinic at the Children's Hospital Medical Center, Boston. The series of activities in the MDPI call upon those intuitions, skills, and strategies the child possesses for solving math problems. The child's approaches are as important as the answers.

Results of the testing led to the definition of two separate and distinct learning styles in mathematics. Comparing the findings of the MDPI with an exhaustive battery of neurological and neuropsychological tests administered at the clinic to the same children established clinically associations between the child's mathematics learning style and the child's hemispheric preference.

A thorough statistical study, involving a wide variety of variables in mathematics, neurology, and neuropsychology coded for the 220 subjects diagnosed at the clinic during a three-year period, was conducted under a research grant from the National Institute of Education. Results of the study confirm that learning styles in mathematics more strongly reflect qualitative aspects of performance than straight success or non-success. Conclusions from the discriminant analyses using the MDPI subtopics for predictor variables conform closely to the assumption of two distinct learning styles. It is of particular interest to find that failure to perform is often as valuable as success, and that "non-learned" characteristics derived from non-formal math activities or from behavioral postures are the most salient factors in reflecting mathematical and cognitive profiles.

An exciting result of this research is the direct applicability it offers for the development of teaching strategies compatible with distinct learning styles in mathematics. It is hoped that differentiated approaches to specific mathematical topics will make mathematics more accessible to students in the future.

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STATISTICAL ANALYSIS OF RESEARCH STUDY

A.0 Statistical Analysis

This section of the report is arranged in the same order as the topics presented in the Overview of Research Design section of the grant proposal. The subsections of the research design are treated with the same numbering scheme in this analysis, for convenience of reference.

As seen in the Coding Key that appears in Section X, many of the variables may be reported by either of two different measurement scales. These scales distinguish between assumed and actual measurements. For the neuropsychological and neurological data, a child's score on a particular variable was based on either direct comments in the neurologist's (or neuropsychologist's) report, or on indirect evidence through implication or lack of negative comments. For the MDPI test items, since they cover a wide range of abilities to accommodate a wide age range, not all items were presented to each child. For those items that were presented to a specific child, the rater entered a score code based on either a tested or assumed (not tested) level of strength on the item.

For the purposes of this project, implied and direct comments from the neurologists and neuropsychologists were merged. In effect, the left digit (0 or 1) in each such variable code (Variables V44 through V92) was eliminated with only the right-hand digit being utilized. For MDPI data, tested and assumed levels of strength were also merged throughout the analyses. Again, only the right-hand digit was utilized for variables V100 through V197 (and V234).

It should be noted that the raw data provided by the neurologists, neuropsychologists, and MDPI test administrator were later processed by a "rater" who quantified this information, assigning numeric scores according to the measurement scales associated with each variable.

The statistics were computed using Version 8.0 of the "Statistical Package for the Social Sciences" (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). This program package, also known as SPSS, was run using the CDC System 73 (CYBER 73).

All multivariate analyses were conducted using casewise deletion of missing data. Thus, if the data for a specific child was missing on one or more of the variables entered into -- say a discriminant analysis -- then that child was completely eliminated from that analysis. While this policy is analytically more sound than other possible choices, it has the effect of sharply reducing the sample size in some instances. To counteract this problem, certain variables with excessive missing data cases were also eliminated from the analyses. These situations will be discussed more fully as they appear throughout the analyses.

In retrospect, the merging of the rating scores 04 (assumed appropriate response) and 14 (tested appropriate response) seemed to cause no question of concern with the neurological and neuropsychological data, nor with the majority of the mathematics data. However, it raised questions of concern regarding the scoring of the more advanced mathematical topics, V134 through V153, in a sizeable number of cases.

Items that were beyond the scope of the child's experience because of age were generally coded 04, meaning that there was no evidence of tested deficits (or strengths). Now at the conclusion of the analysis, it can be seen that the merging of the 04 and 14 ratings, in these cases, may have led to "false positives," meaning that some children recorded as having deficits on earlier tested items may now appear to have appropriate responses on more difficult items beyond their age range.

This situation could have been avoided if such instances had been coded 09 (no basis for assumption); however this would have reduced the number of variables involved in many of the analyses. Or the subjects could have been organized into sub-categories according to age, but then the numbers in each sub-group would not have yielded an adequate basis for statistical analysis. In view of the exploratory status of this study, the merging of these codings was undertaken to maximize the data base and the possible relationships within it.

As it turned out, the variables V134 through V153 were not especially prevalent in the discriminant functions. Instances of their inclusion in discriminant functions may well be spurious, and they may also be preventing other variables from entering the functions. Other variables that do appear in the discriminant functions may have their effects somewhat diminished or even magnified, in the presence of these variables. The discriminant analysis functions should be examined with these limitations in mind.

The table at the end of the discriminant analysis section (page indicates that variables V134 through V153 appeared in discriminant analyses much less frequently than other variables. This is probably an artifact of the scoring problem. Further research will need to be done on these variables, using a more controlled population of subjects of an appropriate age.

RELIABILITY

A.1 Analysis of Research Design -- Section 1

This section of the research design in the grant proposal calls for providing information on inter and intrarater reliability for the MDPI variables.

The specified areas of interest are:

1. What is the relationship between the MDPI scores assigned by two independent raters?
2. What is the relationship between the MDPI scores assigned by the same rater on two separate occasions?

Twenty-four students were selected at random and assigned MDPI scores by each of two raters, hereafter identified as Rater 1 (R1) and Rater 2 (R2). Rater 1, after a time lapse of two months, assigned scores to this same set of students a second time.

As mentioned earlier, variables V134 to V153 were found to have a questionable scoring procedure in a sizeable number of cases, and hence were eliminated from further consideration. The sample size (N = 24) coupled with the nature of the data prevents any definitive statements about inter and/or intrarater reliability; however, a simple comparison was made as follows:

1. A match is defined to be the assignment of identically the same score on an MDPI variable.
2. A mismatch is defined to be any other assignment of scores on an MDPI variable.

The following table shows the number of matches and mismatches on MDPI variables (V100 - V133; V154-V161).

Reliability of Ratings

	Interrater: Rater 1 vs. Rater 2			Intrarater: Rater 1 vs. Rater 1		
	Match	Mismatch	% Match	Match	Mismatch	% Match
V100	24	0	100	24	0	100
V101	24	0	100	24	0	100
V102	24	0	100	24	0	100
V103	24	0	100	23	1	96
V104	24	0	100	24	0	100
V105	23	1	96	22	2	92
V106	23	1	96	23	1	96
V107	22	2	92	23	1	96
V108	23	1	96	23	1	96
V109	23	1	96	23	1	96
V110	24	0	100	24	0	100
V111	24	0	100	24	0	100
V112	24	0	100	24	0	100
V113	20	4	83	20	4	83
V114	24	0	100	23	1	96
V115	22	2	92	23	1	96
V116	23	1	96	23	1	96
V117	24	0	100	23	1	96
V118	24	0	100	24	0	100
V119	24	0	100	24	0	100
V120	24	0	100	24	0	100
V121	22	2	92	23	1	96
V122	22	2	92	22	2	92
V123	22	2	92	22	2	92
V124	23	1	96	23	1	96
V125	23	1	96	23	1	96
V126	24	0	100	20	4	83
V127	24	0	100	23	1	96
V128	23	1	96	23	1	96
V129	23	1	96	22	2	92
V130	22	2	92	24	0	100
V131	24	0	100	23	1	96
V132	24	0	100	22	2	92
V133	24	0	100	24	0	100
V154	22	2	92	22	2	92
V155	24	0	100	24	0	100

Reliability of Ratings, (Cont'd.)

	Interrater: Rater 1 vs. Rater 2			Interrater: Rater 1 vs. Rater 1		
	Match	Mismatch	% Match	Match	Mismatch	% Match
V156	24	0	100	23	1	96
V157	24	0	100	24	0	100
V158	24	0	100	23	1	96
V159	21	3	88	22	2	92
V160	23	1	96	21	3	88
V161	24	0	100	24	0	100

The independent ratings were compared (Rater 1 vs. Rater 2) for each of the 42 MDPI variables. In only two cases, V113 (83% match) and V159 (88% match), was the degree of match less than 90%).

The intrarater comparisons (Rater 1 vs. Rater 1) show that in all but three cases, V113 (83% match), V126 (83% match), and V160 (88% match), the percent of match exceeded 90%.

While no reliability coefficients were obtained, the strength of the correspondence between raters and within rater tends to support the stability of the obtained scores on the MDPI variables. Consequently, all MDPI scores used throughout this study were those assigned by Rater 1 as the first rating.

EXPLORATORY FACTOR ANALYSIS

A.2 Analysis: Research Design -- Section 2

This section of the research design in the grant proposal called for exploratory factor analysis on the MDPI variables.

The specified areas of interest were as follows:

1. Factor analysis of the overall set of MDPI variables.
2. Factor analysis within various age level groups.
3. Factor analysis within clinically identified learning style groups.
4. Factor analysis for other subsets of interest.

As mentioned earlier, there was difficulty in the scoring of Variables V134 to V153 in a sizeable number of cases. This problem most likely led to the creation of Factor 1 in Section A.2.1 below. It also prevented the inclusion of these variables in other factors. Further research with these variables is needed.

A.2.1 Factor Analysis of MDPI Variables -- Overall

A factor analysis was conducted on the MDPI subtopic variables (V100 to V177), excluding those variables having excessive missing data. This limited the input variables to the following: V100 to V136, V140 to V148, V151 to V154, V156 to V158, V163, V165, V 167, V173 to V175, V176, and V177.

The data was analyzed using the SPSS computer program package system with principal factoring and six iterations (PA2). This process involved varimax orthogonal rotations.

The resulting factors are presented in Table A.2.1.1. Only five factors were extracted, by request, and pairwise deletion of missing data was employed. Convergence required six iterations and produced factors that appear to be oriented more to math concept categories than to learning style differences.

Table A.2.1.1

Orthogonal factors obtained by principal factoring (PA 2) with varimax rotation, six iterations, and pairwise deletion of missing data.

FACTOR 1:

Variable	Nomenclature	Factor Loading
V114	Decimals	.63
V136	Addition of Fractions with Different Denominators	.73
V140	Subtraction of Fractions with Same Denominators	.54
V141	Subtraction of Fractions with Different Denominators	.76
V142	Multiplication of Fractions without Cancellation	.92
V143	Multiplication of Fractions with Cancellation	.94
V144	Division of Fractions	.94
V145	Addition of Decimals	.94
V146	Subtraction of Decimals	.94
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V148	Division of Decimals	.89
V151	Concept of Integers	.70
V152	Procedures with Integers	.79
V153	Algebra Skills	.72

Table A.2.1.1, (Cont'd.)

Orthogonal factors obtained by principal factoring (PA2) with varimax rotation, six iterations, and pairwise deletion of missing data.

FACTOR 2:

Variable	Nomenclature	Factor Loading
V100	Number Concepts Summary	.75
V101	Counting Forward	.60
V102	Counting Backwards	.60
V103	Skip Counting	.66
V104	Concept of Quantity	.58
V105	Proficiency with Discrete Models (Sets)	.49
V107	Place Value Concepts	.58
V108	Order of Numbers	.68
V110	Whole Numbers	.49
V117	Arithmetic: Summary	.71
V118	Addition Concepts	.62
V119	Subtraction Concepts	.70
V122	Addition Facts	.70
V123	Subtraction Facts	.69
V126	Compensatory Strategies in the Recall of Facts	.63
V127	Addition Without Regrouping	.75

Table A.2.1.1, (Cont'd.)

Orthogonal factors obtained by principal factoring (PA2) with varimax rotation, six iterations, and pairwise deletion of missing data.

FACTOR 2, (Cont'd.)

Variable	Nomenclature	Factor Loading
V128	Addition With Regrouping	.67
V129	Subtraction Without Regrouping	.67
V165	Applications to Real-Life Situations	.46
V173	Achievement at Grade Level	.62
V174	Development (Maturity) Findings	.50
V176	Sustaining Behavior	.49

FACTOR 3:

Variable	Nomenclature	Factor Loading
V109	Mathematics Symbolism: Summary	.47
V113	Fractional Numbers	.71
V120	Multiplication Concepts	.50
V121	Division Concepts	.64
V124	Multiplication Facts	.63
V125	Division Facts	.68
V131	Multiplication With One-Digit Multiplier	.62

Table A.2.1.1, (Cont'd.)

Orthogonal factors obtained by principal factoring (PA2) with varimax rotation, six iterations, and pairwise deletion of missing data.

FACTOR 3, (Cont'd.)

Variable	Nomenclature	Factor Loading
V132	Multiplication With Two-Digit Multiplier	.78
V133	Division With One-Digit Divisor	.71
V135	Addition of Fractions With Same Denominators	.44

FACTOR 4:

Variable	Nomenclature	Factor Loading
V154	Geometry: Summary	.82
V156	Appreciation of Detail	.68
V157	Appreciation of Overall Configuration	.75
V158	Organizational Skills in Geometry	.78

FACTOR 5:

Variable	Nomenclature	Factor Loading
V120	Multiplication Concepts	.51
V124	Multiplication Facts	.52

Table A.2.1.1, (Cont'd.)

Orthogonal factors obtained by principal factoring (PA 2) with varimax rotation, six iterations, and pairwise deletion of missing data.

FACTOR 5, (Cont'd.)

Variable	Nomenclature	Factor Loading
V130	Subtraction With Regrouping	.43
V131	Multiplication With One-Digit Multiplier	.46
V163	Problem Solving Intuitions and Strategies: Summary	.41
V167	Sequences	.45
V175	Overall Math Sense	.43

Table A.2.1.2

Factor eigenvalues and percents of variance accounted for by unrotated factors.

Factor	Eigenvalue	Percent of Variance
1	11.34	36.4
2	10.65	34.2
3	4.49	14.4
4	2.69	8.6
5	2.00	6.4

Table A.2.1.3

Transformation matrix used for rotation.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	0.18	0.86	0.29	0.28	0.27
Factor 2	0.92	-0.25	0.27	-0.02	-0.07
Factor 3	-0.31	-0.36	0.81	0.27	0.20
Factor 4	0.09	-0.22	-0.39	0.88	0.12
Factor 5	-0.08	0.16	0.19	0.26	-0.93

Factor 1 is seen to load heavily on the topics of fractions and decimals, which relate to items only administered to students at least in Grades 4, 5, and 6, and on the topics of integers and algebraic skills, which relate to items only administered to a still smaller population of students at least in Grade 8.

Factor 2 is seen to load heavily on numerical concepts of counting, place value, addition, and subtraction, together with the multi-digit operations of addition with and without regrouping, and subtraction without regrouping. These are typical end-of-Grade 2 skills.

Factor 3 is seen to load mainly on multiplication and division, and early fractional concepts. These are typical end-of-Grade 5 skills.

Factor 4 loads on the geometric aspects of the test.

Factor 5 loads on multiplication, subtraction with regrouping, and selected aspects of problem solving.

A.2.2 Factor Analysis of MDPI Variables -- Age Groups

A factor analysis was conducted using MDPI variables (V100 - V211) considered to be related to Learning Style I or II, except for those having excessive missing data. Children under age 9 were excluded from this analysis. Casewise deletion of missing data was used, reducing the total sample to 96 cases for the following variables: V101, V102, V105, V106, V119, V120, V121, V127 to V134, V156, V157, V167, V177, V199, V208, V209, V210, V211. The data was analyzed using the SPSS computer program package system with principal factoring and six iterations (PA2). This process involved Varimax orthogonal rotations. Only six iterations were allowed and complete convergence was not acquired.

The resulting five most important factors were extracted and are presented in Table A.2.2.1.

Table A.2.2.1

Orthogonal factors obtained by principal factoring (PA 2).

FACTOR 1:

Variable	Nomenclature	Factor Loading
V105	Proficiency With Discrete Models (Sets)	.52
V119	Subtraction Concepts	.47
V127	Addition Without Regrouping	.74
V128	Addition With Regrouping	.85
V129	Subtraction Without Regrouping	.86
V130	Subtraction With Regrouping	.63

Table A.2.2.1, (Cont'd.)

Orthogonal factors obtained by principal factoring (PA 2).

FACTOR 2:

Variable	Nomenclature	Factor Loading
V101	Counting Forward	.42
V102	Counting Backwards	.40
V120	Multiplication Concepts	.76
V121	Division Concepts	.42
V131	Multiplication With One-Digit Multiplier	.66
V132	Multiplication With Two-Digit Multiplier	.54

FACTOR 3:

Variable	Nomenclature	Factor Loading
V156	Appreciation of Detail	.76
V157	Appreciation of Overall Configuration	.66
V167	Sequences	.47
V211	Mathematics Learning Style II Impaired	-.56

Table A.2.2.1, (Cont'd.)

Orthogonal factors obtained by principal factoring (PA 2).

FACTOR 4:

Variable	Nomenclature	Factor Loading
V208	Mathematics Learning Style I Preferred	-.93
V209	Mathematics Learning Style II Preferred	.84

FACTOR 5:

Variable	Nomenclature	Factor Loading
V121	Division Concepts	.42
V132	Multiplication With Two-Digit Multiplier	.59
V133	Division With One Digit Divisor	.85
V134	Division With Two-Digit Divisor	.49

Table A.2.2.2

Factor eigenvalues and percents of variance accounted for by unrotated factors.

Factor	Eigenvalue	Percent of Variance
1	5.96	49.6
2	2.43	20.2
3	1.70	14.1
4	1.02	8.5
5	.90	7.5

Table A.2.2.3

Transformation matrix used for rotation.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	.65	.56	.39	.14	.30
Factor 2	.55	.03	-.53	-.57	-.30
Factor 3	-.33	.16	.14	-.73	.57
Factor 4	-.09	.27	-.74	.35	.49
Factor 5	.40	-.77	.03	.05	.50

Factor 1 is seen to load heavily on addition and subtraction applications.

Factor 2 is seen to load mainly on multiplication and division concepts and applications, but with some relationship to counting backwards and forward.

Factor 3 relates the degree of impairment of Learning Style II inversely to Appreciation of Detail (V156), Appreciation of Overall Configuration (V157), and Sequences (V167).

Factor 4 relates the preferences of Learning Styles I and II, inversely.

Factor 5 loads on the multiplication and division applications (excluding V134 to V153).

A.2.3 Factor Analysis of MDPI Variables -- Within Clinically Identified Learning Style Groups

No factor analysis was conducted for this area since the subdivision of the data set produced sample sizes too small for use in factor analysis.

A.2.4 Factor Analysis of MDPI Variables -- Other Subsets of Interest

No factor analysis was conducted by sex group since the total sampled contained only 58 females.

A factor analysis was conducted on the MDPI variables (V100 to V211) judged to be either Learning Style I or II variables, excluding those variables having excessive missing data. Thus, the input variables were V101, V102, V105, V106, V119, V120, V121, V127 to V134, V156, V157, V167, V177, V199, V208 to V211.

The resulting main five factors are presented in Table A.2.4.1 below. Only six iterations were allowed and complete convergence was not achieved. Casewise exclusion of missing data was selected.

Table A.2.4.1

Orthogonal Factors obtained by Principal Factoring (PA2).

FACTOR 1:

Variable	Nomenclature	Factor Loading
V105	Proficiency With Discrete Models (Sets)	.56
V106	Proficiency With Continuous Models (Rods)	.48
V127	Addition Without Regrouping	.85

Table A.2.4.1, (Cont'd.)

FACTOR 1, (Cont'd.)

Variable	Nomenclature	Factor Loading
V128	Addition With Regrouping	.86
V129	Subtraction Without Regrouping	.91

FACTOR 2:

Variable	Nomenclature	Factor Loading
V121	Division Concepts	.63
V132	Multiplication With Two-Digit Multiplier	.76
V133	Division With One-Digit Divisor	.94

FACTOR 3:

Variable	Nomenclature	Factor Loading
V120	Multiplication Concepts	.81
V130	Subtraction With Regrouping	.54
V131	Multiplication With One-Digit Multiplier	.69

FACTOR 4:

Variable	Nomenclature	Factor Loading
V208	Mathematics Learning Style I Preferred	-.92
V209	Mathematics Learning Style II Preferred	.88

Table A.2.4.1, (Cont'd.)

FACTOR 5:

Variable	Nomenclature	Factor Loading
V156	Appreciation of Detail	.83
V157	Appreciation of Overall Configuration	.70
V211	Mathematics Learning Style II Impaired	-.50

Table A.2.4.2

Factor eigenvalues and percents of variance accounted for by unrotated factors.

Factor	Eigenvalue	Percent of Variance
1	4.82	41.1
2	2.69	22.9
3	1.91	16.3
4	1.21	10.4
5	1.09	9.3

Table A.2.4.3

Transformation matrix used for rotation.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	.68	.37	.50	.19	.35
Factor 2	-.64	.67	.07	.22	.31
Factor 3	-.01	.35	.27	-.86	-.25
Factor 4	.16	.42	-.09	.38	-.81
Factor 5	.33	.35	-.82	-.19	.25

Factor 1 is seen to load heavily on proficiency with discrete and continuous models, addition with and without regrouping, and subtraction without grouping. These are early Grade 2 skills.

Factor 2 is seen to load on more advanced multiplication and division, typical of early Grade 5 skills.

Factor 3 loads on multiplication concepts, multiplication with one-digit multiplier, and subtraction with regrouping, typical of early Grade 4 skills.

Factor 4 relates the preferences of Learning Styles I and II inversely.

Factor 5 relates the degree of impairment of Learning Style II inversely with Appreciation of Detail and Appreciation of Overall Configuration.

A.3 Analysis: Research Design -- Section 3

This section of the research design in the grant proposal examines the "Relationship Between General Learning Style (In Terms of Hemispheric Considerations) and Mathematics Performance (Exploratory)." It calls for the use of discriminant analysis as follows:

1. To determine which subtopics of the MDPI are the best predictors of general learning style categories based on clinical predictions of learning style categories.

2. To determine which subtopics of the MDPI are the best predictors of MDPI rater predictions of mathematics learning style types.

In addition to the above-mentioned areas suggested in the research design, it was felt that MDPI rater observation might also be used to advantage as predictors. This objective caused the creation of four new areas for analysis:

3. To determine which of the MDPI rater observations are the best predictors of general learning style categories based on clinical predictions of learning style categories.

4. To determine which of the MDPI subtopics and MDPI rater observations are the best predictors of general learning style categories based on clinical predictions of learning style categories.

5. To determine which of the MDPI rater observations are the best predictors of the MDPI rater predictions of mathematics learning style types.

6. To determine which of the MDPI subtopics and MDPI rater observations are the best predictors of MDPI rater predictions of mathematics learning style types.

The six areas described above were analyzed by the discriminant analysis program of SPSS, Version 8.0. A stepwise solution approach was employed using the Wilks' Lambda Selection Criterion. Note that the use of stepwise selection and cross validation is essential when considerable multicollinearity (correlation among the discriminating variables) is present. It was recommended in the grant proposal that a follow-up project be undertaken to perform cross validation since the relatively small sample sizes available in this project could not be further reduced to allow both a sample for constructing discriminant function and a sample for cross validation. Only variables found to have strong predictive power in both this project and the follow-up project should be retained.

Due to the exploratory nature of this study, the major emphasis has been on developing sets of discriminating variables that maximize the classification rate, for the various group variables. This approach has obvious advantages, but necessitates certain compromises, particularly in the area of function interpretation in the presence of suppressor variables.

Elimination of suppressor variables would have required extensive additional analysis, and consequently greatly diminished the scope of this project. It was decided that the purposes of this project would be better served through use of a broad exploratory approach, leaving the finer details for a later confirmatory stage project.

In the current project, the final solution for each discriminant function was computed using data from only those children (cases) having no missing data on the group variable, nor on any of the discriminating variables. The classification stage involved using the discriminant function to predict group membership for all cases having data on the group variable.

When the data for a case was missing on a discriminating variable, the total mean of that variable was substituted. This policy provides increased evidence of the generalizability of the discriminant function.

In analyses involving the neuropsychological variables (V44 to V47) or the neurological variables (V70 to V73) as group variables, the specific group variable used was collapsed from five to two code categories as follows:

CODE 1 = Deficiency. (Less than adequate functioning.)

CODE 2 = No deficiency. (At least adequate functioning.)

In analyses involving the MDPI rater prediction variables (V208 to V211), the variables remained as initially specified -- each having two categories.

For convenient reference, the following table lists the subsection of this report that contains each specific discriminant analysis.

DISCRIMINATING VARIABLES

Group Variable	MDPI Subtopics V100 to V172[a]	MDPI Rater Observations V173 to V214[b]	MDPI Subtopics and Rater Observations V100 to V214[c]
V44: Left Hemispheric Function - Neuropsychological	A.3.1.1	A.3.3.1	A.3.4.1
V45: Right Hemispheric Function - Neuropsychological	*	*	*
V46: Left Frontal Function - Neuropsychological	A.3.1.2	A.3.3.2	A.3.4.2
V47: Right Frontal Function - Neuropsychological	A.3.1.3	A.3.3.3	A.3.4.3
V70: Left Hemispheric Function - Neurological	A.3.1.4	A.3.3.4	A.3.4.4
V71: Right Hemispheric Function - Neurological	A.3.1.5	A.3.3.5	A.3.4.5
V72: Left Frontal Function - Neurological	*	*	*
V73: Right Frontal Function - Neurological	*	*	*
V208: Mathematics Learning Style I Preferred	A.3.2.1	A.3.5.1	A.3.6.1
V209: Mathematics Learning Style II Preferred	A.3.2.2	A.3.5.2	A.3.6.2
V210: Mathematics Learning Style I Impaired	A.3.2.3	**	**
V211: Mathematics Learning Style II Impaired	A.3.2.4	**	**

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* Eliminated from analysis due to poor distribution of the group variable. Almost all children (cases) received the same score.

** Columns 2 and 3 of this table were not called for in the grant proposal, and although many of these analyses have been included, these four were not included.

a. The following variables were eliminated due to excessive missing data: V138, V139, V146, V149, V150, V155, V159 to V162, V166, and V168 to V172.

b. Variable V205 was eliminated due to excessive missing data.

c. The variables mentioned in the two preceding footnotes were eliminated due to excessive missing data.

A.3.1 Discriminant Analysis of Area 1

The five subsections of this section contain the details of the discriminant analyses used to predict the neuropsychological conclusions (V44, V46, and V47) and the neurological conclusions (V70 and V71) from the MDPI subtopics (V100 to V172). Note that the following variables were eliminated due to excessive missing data: V138, V139, V146, V149, V150, V155, V159 to V162, V166, and V168 to V172.

A.3.1.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Subtopics as Discriminating Variables.

The discriminant function was created from 131 cases distributed on the group variable as follows:

58 cases having Code 1
(Deficiency -- less than adequate functioning.)

73 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained nine variables and provided correct classification for 62% of the 201 cases having data for the group variable. A table of these results follows:

V44 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	59 (57.8%)	66 (66.7%)	62.2%
Incorrectly identified:	43 (42.2%)	33 (33.7%)	

This discriminant function has a modest ability for predicting the neuropsychological conclusion of the Left Hemispheric

A.3.1.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

Function (V44). Its main strength is for correctly identifying instances of non-deficiency in V44.

The existence of a modest relationship between the actual group membership and the predicted group membership for the above data (with table rearranged) is readily established by the chi-square test which yields

$$x_1^2 = 12.16, \ p < .001.$$

That the discriminant function has only modest discriminating power is evidenced by its Wilks' lambda value of .8246.

The canonical correlation coefficient's value of .4188 indicates a weak relationship between the group variable and the discriminant function. The square of this coefficient indicates that approximately 17.5% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contribution of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.1.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients	
		Standardized	Unstandardized
V108	Order of Numbers	-0.379	-0.871
V109	Mathematics Symbolism: Summary	0.581	1.026
V113	Fractional Numbers	-0.540	-0.442
V116	Shapes	-0.521	-1.317
V123	Subtraction Facts	0.653	0.746
V125	Division Facts	-0.581	-0.591
V130	Subtraction with Regrouping	-0.330	-0.265
V137	Money	-0.699	-1.788
V152	Procedures with Integers	0.485	1.026
(Constant)			6.331

A.3.1.2 Discriminant Analysis of Left Frontal Function (V46) Using MDPI Subtopics as Discriminating Variables

This discriminant function was eliminated since its chi-square value was not significant (p = .07). The MDPI subtopics did not show strong predictive value for V46.

A.3.1.3 Discriminant Analysis of Right Frontal Function (V47) Using MDPI Subtopics as Discriminating Variables

This discriminant function was eliminated since its chi-square value was not significant (p = .06). The MDPI subtopics did not show strong predictive value for V47.

A.3.1.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Subtopics as Discriminating Variables

The discriminant function was created using 110 cases distributed on the group variable as follows:

43 cases having Code 1
(Deficiency -- less than adequate functioning.)

67 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 11 variables and provided correct classification for 68% of the 199 cases having data for the group variable. A table of these results follows:

	V70 Actual Group		
	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	42 (56.0%)	94 (75.8%)	68.34%
Incorrectly identified:	33 (44.0%)	30 (24.2%)	

This discriminant function has considerable ability for predicting the neurological conclusion concerning the Left Hemispheric

A.3.1.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Subtopics as Discriminating Variables (Cont'd.)

Function (V70). It is particulary strong for correctly identifying instances of non-deficiency in V70, scoring 76% for such cases. The identification of non-deficiency is valuable for preventing the false labeling of children.

The existence of a strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$\underline{x^2_1 = 20.48, \; p < .001.}$$

That the discriminant function has considerable discriminating power is evidenced by its Wilks' lambda value of .7262 and a highly significant chi-square value of

$$\underline{x^2_{11} = 32.79, \; p < .001.}$$

The canonical correlation coefficient's value of .5232 indicates that the group variable and the discriminant function have a strong relationship. The square of this coefficient indicates that 27.4% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.1.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Subtopics as Discriminating Variables (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	 Unstandardized
V103	Skip Counting	-0.637	-1.149
V106	Proficiency with Continuous Models	0.278	0.390
V110	Whole Numbers	0.442	0.708
V111	Reversals in Digits	-0.399	-2.136
V113	Fractional Numbers	0.370	0.277
V116	Shapes	0.238	0.609
V130	Subtraction with Regrouping	0.619	0.494
V133	Division with One-Digit Divisor	-0.354	-0.288
V135	Addition of Fractions with Same Denominators	-0.546	-0.548
V164	Pictorial Graphs	-0.591	-1.002
V167	Sequences	0.315	0.318
(Constant)			9.864

A.3.1.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Subtopics as Discriminating Variables

The discriminant function was created using 171 cases distributed on the group variable as follows:

65 cases having Code 1
(Deficiency -- less than adequate functioning.)

106 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained nine variables and provided correct classification for 62% of the 199 cases having data for the group variable. A table of these results follows:

V71 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	42 (56.8%)	81 (64.8%)	61.81%
Incorrectly identified:	32 (43.2%)	44 (35.2%)	

This discriminant function has modest ability for predicting the neurological conclusion concerning the Right Hemispheric Function (V71). It is strongest for correctly identifying instances of non-deficiency in V71 scoring 65% for such cases. The identification of non-deficiency is valuable for preventing the false labeling of children.

The existence of a modest relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

A.3.1.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Subtopics as Discriminating Variables (Cont'd.)

$$x^2_1 = 8.80,\ p < .01.$$

That the discriminant function has only moderate discriminating power is evidenced by its Wilks' lambda value of .8768 and a significant chi-square value of

$$x^2_9 = 21.6,\ p < .01.$$

The canonical correlation coefficient's value of .3510 indicates that the group variable and the discriminant function have a modest relationship. The square of this coefficient indicates that 12.3% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.1.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Subtopics as Discriminating Variables (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	 Unstandardized
V109	Mathematics Symbolism: Summary	-0.758	-1.380
V112	Reversals of Place Values	0.557	1.107
V115	Operational Signs	0.361	0.621
V117	Arithmetic: Summary	-0.288	-0.308
V121	Division Concepts	0.366	0.376
V131	Multiplication with One-Digit Multiplier	0.335	0.264
V141	Subtraction of Fractions with Different Denominators	0.431	0.579
V151	Concept of Integer	-0.479	-1.490
V156	Appreciation of Detail	-0.391	-0.496
(Constant)			2.132

A.3.2 Discriminant Analysis of Area 2

The four subsections of this section contain the details of discriminant analyses used to predict the MDPI rater conclusions (V208 to V211) from the MDPI subtopics. Note that the following variables were eliminated due to excessive missing data: V138, V139, V146, V149, V150, V155, V159 to V162, V166, and V168 to V172.

A.3.2.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Preferred (V208) Using MDPI Subtopics as Discriminating Variables

The discriminant function was created using 139 cases distributed on the group variable as follows:

38 cases having Code 1
(Mathematics Learning Style I not preferred.)

101 cases having Code 2
(Mathematics Learning Style I preferred.)

The optimal linear discriminant function for this analysis contained 10 variables and provided correct classification for 79% of the 178 cases having data for the group variable. A table of these results follows:

V208 Actual Group

	Not Preferred	Preferred	Total % Correctly Identified
Correctly identified:	45 (81.8%)	96 (78.0%)	79.21%
Incorrectly identified:	10 (18.2%)	27 (22.0%)	

A.3.2.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I. Preferred (V208) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

This discriminant function has a very strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style I was preferred (V208).

The existence of a very strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$x^2_1 = 56.55,\ p < .0001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .5907 and a very significant chi-square value of

$$x^2_{10} = 69.5,\ p < .0001.$$

The canonical correlation coefficient's value of .6398 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 40.9% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.2.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Preferred (V208) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients	
		Standardized	Unstandardized
V106	Proficiency with Continuous Model	-0.325	-0.501
V107	Place Value Concepts	0.574	0.963
V112	Reversals of Place Values	0.310	1.003
V115	Operational Signs	0.402	0.918
V116	Shapes	-0.199	-0.632
V124	Multiplication Facts	-0.252	-0.248
V156	Appreciation of Detail	0.543	0.679
V157	Appreciation of Overall Configuration	-0.922	-1.072
V163	Problem Solving Intuitions and Strategies: Summary	-0.413	-0.611
V165	Applications to Real-Life Situations	-0.200	-0.308
(Constant)			-2.119

A.3.2.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Subtopics as Discriminating Variables

The discriminant function was created using 150 cases distributed on the group variable as follows:

114 cases having Code 1
(Mathematics Learning Style II Not Preferred)

36 cases having Code 2
(Mathematics Learning Style II Preferred)

The Optimal linear discriminant function for this analysis contained 12 variables and provided correct classification for 79% of the 178 cases having data for the group variable. A table of these results follows:

V209 Actual Group

	Not Preferred	Preferred	Total % Correctly Identified
Correctly identified:	107 (79.9%)	33 (75.0%)	78.65%
Incorrectly identified:	27 (20.1%)	11 (25.0%)	

This discriminant function has a very strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style II was preferred (V209).

The existence of a very strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

A.3.2.2 Discrimininant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

$$x^2_1 = 44.60,\ p < .0001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .6383 and a very significant chi-square value of

$$x^2_{12} = 63.8,\ p < .0001.$$

The canonical correlation coefficient's value of .6014 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 36.2% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.2.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	Unstandardized
V102	Counting Backwards	0.228	0.431
V105	Proficiency with Discrete Models	0.386	0.472
V106	Proficiency with Continuous Models	-0.330	-0.484
V109	Mathematics Symbolism: Summary	0.619	1.138
V110	Whole Numbers	-0.254	-0.418
V114	Decimals	-0.326	-0.459
V116	Shapes	-0.431	-1.236
V122	Addition Facts	-0.318	-0.477
V154	Geometry: Summary	0.264	0.420
V156	Appreciation of Detail	0.446	0.573
V157	Appreciation of Overall Configuration	-1.055	-1.227
V163	Problem Solving Intuitions and Strategies: Summary	-0.447	-0.652
(Constant)			6.685

A.3.2.3 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Impaired (V210) Using MDPI Subtopics as Discriminating Variables

The discriminant function was created using 182 cases distributed on the group variable as follows:

46 cases having Code 1
(Mathematics Learning Style I not impaired.)

136 cases having Code 2
(Mathematics Learning Style I impaired.)

The optimal linear discriminant function for this analysis contained two variables and provided correct classification for 80% of the 184 cases having data for the group variable. A table of these results follows:

V210 Actual Group

	Not Impaired	Impaired	Total % Correctly Identified
Correctly identified:	33 (71.7%)	115 (83.3%)	80.43%
Incorrectly identified:	13 (28.3%)	23 (16.7%)	

This discriminant function has a very strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style I was impaired (V210).

The existence of a strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

A.3.2.3 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Impaired (V210) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

$$x^2_1 = 49.42, \ p < .0001.$$

That the discriminant function has strong discriminating power is evidenced by its Wilks' lambda value of .7207 and a very highly significant chi-square value of

$$x^2_2 = 58.6, \ p < .0001.$$

The canonical correlation coefficient's value of .5285 indicates that the group variable and the discriminant function have a strong relationship. The square of this coefficient indicates that 27.9% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

Variable	Nomenclature	Discriminant Function Coefficients Standardized	Unstandardized
V117	Arithmetic: Summary	0.915	1.233
V154	Geometry: Summary	0.245	0.376
(Constant)			-4.750

A.3.2.4 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Impaired (V211) Using MDPI Subtopics as Discriminating Variables

The discriminant function was created using 149 cases distributed on the group variable as follows:

66 cases having Code 1
(Mathematics Learning Style II Not Impaired)

93 cases having Code 2
(Mathematics Learning Style II Impaired)

The optimal linear discriminant function for this analysis contained 12 variables and provided correct classification for 77.3% of the 185 cases having data for the group variable. A table of these results follows:

V211 Actual Group

	Not Impaired	Impaired	Total % Correctly Identified
Correctly identified:	61 (80.3%)	82 (75.2%)	77.30%
Incorrectly identified:	15 (19.7%)	27 (24.8%)	

This discriminant function has a very strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style II was impaired (V211).

The existence of a very strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

A.3.2.4 Discriminant Analysis of the MDPI Rater Conclusion of: Mathematics Learning Style II Impaired (V211) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

$$x^2_1 = 55.29, \ p < .0001.$$

That the discriminant function has discriminating power is evidenced by its Wilks' lambda value of .5598 and a very highly significant chi-square value of

$$x^2_{12} = 81.8, \ p < .0001.$$

The canonical correlation coefficient's value of .6635 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 44.0% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.2.4 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Impaired (V211) Using MDPI Subtopics as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	 Unstandardized
V105	Proficiency with Discrete Models	-0.381	-0.528
V108	Order of Numbers	0.381	2.728
V114	Decimals	-0.362	-0.501
V120	Multiplication Concepts	0.486	0.522
V125	Division Facts	-0.273	-0.312
V129	Subtraction Without Regrouping	-0.344	-0.331
V131	Multiplication with One-Digit Multiplier	-0.402	-0.340
V132	Multiplication with Two-Digit Multiplier	-0.328	-0.303
V144	Division of Fractions	-0.284	-0.455
V148	Division of Decimals	0.867	1.222
V158	Organizational Skills in Geometry	-0.580	-0.858
V163	Problem Solving Intuitions and Strategies: Summary	-0.265	-0.376
(Constant)			-3.653

A.3.3 Discriminant Analysis of Area 3

The five subsections of this section contain the details of the discriminant analyses used to predict the neuropsychological conclusions (V44, V46, and V47) and the neurological conclusions (V70 and V71) from the MDPI rater observations and conclusions (V173 to V214). Note that variable V205 was eliminated due to excessive missing data.

A.3.3.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Rater Observation and Conclusion as Discriminating Variables

The discriminant function was created using 170 cases distributed on the group variable as follows:

80 cases having Code 1
(Deficiency-- less than adequate functioning.)

90 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained five variables and provided correct classification for 66% of the 201 cases having data for the group variable. A table of these results follows:

V44 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	68 (66.7%)	65 (65.7%)	66.17%
Incorrectly identified:	34 (33.3%)	34 (34.3%)	

This discriminant function has a modest ability for predicting the neuropsychological conclusion of the Left Hemispheric Function (V44).

A.3.3.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Rater Observation and Conclusion as Discriminating Variables, (Cont'd.)

The existence of a modest relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$x^2_1 = 21.0, \ p < .001.$$

That the discriminant function has modest discriminating power is evidenced by its Wilks' lambda value of .8813 and a highly significant chi-square value of

$$x^2_6 = 20.8, \ p < .002.$$

The canonical correlation coefficient's value of .3445 indicates that the group variable and the discriminant function have a weak relationship. The square of this coefficient indicates that 11.9% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.3.1 Discrimininant Analysis of Left Hemispheric Function (V44) Using MDPI Rater Observation and Conclusion as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	 Unstandardized
V191	Implementation of Procedures	0.662	0.877
V193	Organizational Skills	-0.431	-0.561
V196	Attentional Functioning	0.411	0.554
V200	Impulsivity	-0.297	-0.766
V212	Behavioral Considerations	0.721	1.467
(Constant)			-5.519

A.3.3.2 Discriminant Analysis of Left Frontal Function (V46) Using MDPI Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 129 cases distributed on the group varicble as follows:

51 cases having Code 1
(Deficiency -- less than adequate functioning.)

78 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 14 variables and provided correct classification for 69% of the 201 cases having data for the group variable. A table of these results follows:

V46 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	47 (70.1%)	92 (68.7%)	69.15%
Incorrectly identified:	20 (29.9%)	42 (31.3%)	

This discriminant function has a strong ability for predicting the neuropsychological conclusion concerning the Left Frontal Function (V46).

The existence of a strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

A.3.3.2 Discriminant Analysis of Left Frontal Function (V46) Using MDPI Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

$$\chi^2_1 = 27.26,\ p < .001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .6164 and a highly significant chi-square value of

$$\chi^2_{14} = 58.1,\ p < .0001.$$

The canonical correlation coefficient's value of .6194 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 38.4% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.3.2 Discriminant Analysis of Left Frontal Function (V46) Using MDPI Rater Observation and Conclusion as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	 Unstandardized
V173	Achievement at Grade Level	-0.772	-1.006
V183	Memory for Multi-Step Procedures	0.520	0.543
V184	Memory for Directions	-0.314	-0.408
V185	Memory for Pertinent Mathematical Data	-0.359	-0.571
V186	Visual Memory	-0.681	-0.902
V188	Spontaneous Self-Structuring	0.261	0.333
V191	Implementation of Procedures	0.292	0.397
V193	Organizational Skills	0.359	0.478
V195	Precision of Responses	-0.262	-0.314
V196	Attentional Functioning	0.863	1.219
V197	Ability to Learn New Skills/Procedures	-0.361	-0.654
V204	Flexibility in Approaches	0.714	1.723
V208	Mathematics Learning Style I Preferred	-0.278	-0.608
V212	Behavioral Considerations	0.470	0.951
(Constant)			0.780

A.3.3.3 Discriminant Analysis of Right Frontal Function (V47) Using MDPI Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 131 cases distributed on the group variable as follows:

49 cases having Code 1
(Deficiency -- less than adequate functioning.)

82 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 14 variables and provided correct classification for 72% of the 201 cases having data for the group variable. A table of these results follows:

V47 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	45 (70.3%)	99 (72.3%)	71.64%
Incorrectly identified:	19 (29.7%)	38 (27.7%)	

This discriminant function has a strong ability for predicting the neuropsychological conclusion concerning the Right Frontal Function (V47).

The existence of a strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

A.3.3.3 Discriminant Analysis of Right Frontal Function (V47) Using MDPI Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

$$\chi^2_1 = 32.62,\ p < .001.$$

That the discriminant function has strong discriminating power is evidenced by its Wilks' lambda value of .6953 and a highly significant chi-square value of

$$\chi^2_{14} = 44.3,\ p < .0001.$$

The canonical correlation coefficient's value of .5520 indicates that the group variable and the discriminant function have a strong relationship. The square of this coefficient indicates that 30.5% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.3.3 Discriminant Analysis of Right Frontal Function (V47) Using MDPI Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	Unstandardized
V173	Achievement at Grade Level	0.692	0.897
V182	Memory for Arithmetic Facts	0.301	0.332
V183	Memory for Multi-Step Procedures	-0.612	-0.624
V184	Memory for Directions	0.208	0.268
V186	Visual Memory	0.435	0.566
V188	Spontaneous Self-Structuring	-0.352	-0.450
V199	Need for Reauditorization Techniques	-0.375	-0.745
V200	Impulsivity	-0.272	-0.737
V204	Flexibility in Approaches	-0.383	-0.907
V206	Mathematics Learning Style I Operative	-0.446	-5.119
V208	Mathematics Learning Style I Preferred	0.535	1.184
V210	Mathematics Learning Style I Impaired	0.497	1.093
V212	Behavioral Considerations	-0.298	-0.603
V214	Need for Extraneous Conversation	0.683	2.031
(Constant)			4.756

A.3.3.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 117 cases distributed on the group variable as follows:

49 cases having Code 1
(Deficiency -- less than adequate functioning.)

68 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 11 variables and provided correct classification for 68% of the 199 cases having data for the group variable. A table of these results follows:

V70 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	47 (62.7%)	88 (71.0%)	67.84%
Incorrectly identified:	28 (37.3%)	36 (29.0%)	

This discriminant function has considerable ability for predicting the neurological conclusion concerning the Left Hemispheric Function (V70).

The existence of a relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

A.3.3.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

$$x^2_1 = 21.75,\ p < .001.$$

That the discriminant function has strong discriminating power is evidenced by its Wilks' lambda value of .7005 and a highly significant chi-square value of

$$x^2_{12} = 38.8,\ p < .0002.$$

The canonical correlation coefficient's value of .5473 indicates that the group variable and the discriminant function have a strong relationship. The square of this coefficient indicates that 29.9% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.3.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients	
		Standardized	Unstandardized
V173	Achievement at Grade Level	0.506	0.641
V175	Overall "Math Sense"	-0.407	-0.553
V176	Sustaining Behavior	0.811	1.135
V177	Attention to Detail	-0.266	-0.530
V186	Visual Memory	0.492	0.689
V198	Need for Manipulative Materials	0.735	1.488
V200	Impulsivity	-0.506	-1.411
V203	Diversity in Approaches	0.421	0.994
V212	Behavioral Considerations	0.441	0.890
V213	Need for Extraneous Physical Activity	-0.399	-1.012
V214	Need for Extraneous Conversation	0.561	1.721
(Constant)			-8.643

A.3.3.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 125 cases distributed on the group variable as follows:

48 cases having Code 1
(Deficiency -- less than adequate functioning.)

77 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 12 variables und provided correct classification for 63% of the 199 cases having data for the group variable. A table of these results follows:

	V71 Actual Group		
	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	44 (59.5%)	82 (65.6%)	63.32%
Incorrectly identified:	30 (40.5%)	43 (34.4%)	

This discriminant function has a modest ability for predicting the neurological conclusion concerning the Right Hemispheric Function (V71).

A.3.3.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Rater Observations and Conclusions as Discriminating Variables and Conclusions, (Cont'd.)

The existence of a relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$x^2_1 = 11.86, \ p < .001.$$

That the discriminant function has strong discriminating power is evidenced by its Wilks' lambda value of .7411 and a highly significant chi-square value of

$$x^2_{12} = 35.1, \ p < .0006.$$

The canonical correlation coefficient's value of .5088 indicates that the group variable and the discriminant function have a strong relationship. The square of this coefficient indicates that 25.9% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.3.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Rater Observations and Conclusions as Discriminating Variables and Conclusions, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	Unstandardized
V180	Anticipated Math Growth	-0.500	-0.752
V181	Memory Skills: Summary	-0.716	-0.928
V186	Visual Memory	-0.280	-0.372
V194	Integration of Multi-Step Procedures	0.324	0.397
V195	Precision of Responses	-0.309	-0.385
V196	Attentional Functioning	0.348	0.471
V197	Ability to Learn New Skills/Procedures	0.327	0.665
V200	Impulsivity	-0.263	-0.699
V201	Perseveration	0.380	0.903
V203	Diversity in Approaches	0.263	0.637
V206	Mathematics Learning Style I Operative	-0.222	-2.491
V209	Mathematics Learning Style II Preferred	-0.378	-0.919
(Constant)			7.070

A.3.4 Discriminant Analysis of Area 4

The five subsections of this section contain the details of discriminant analyses used to predict the neuropsychological conclusions (V44, V46, and V47) and the neurological conclusions (V70 and V71) from the MDPI subtopics and MDPI rater observations and conclusions (V100 to V214). Note that the following variables were eliminated due to excessive missing data: V138, V139, V146, V149, V150, V155, V159 to V162, V166, V168 to V172, and V205.

A.3.4.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 131 cases distributed on the group variable as follows:

58 cases having Code 1
(Deficiency -- less than adequate functioning.)

73 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained nine variables and provided correct classification for 63% of the 201 cases having data for the group variable. A table of these results follows:

V44 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	59 (57.8%)	68 (68.7%)	63.18%
Incorrectly identified:	43 (42.2%)	31 (31.3%)	

A.3.4.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

This discriminant function has a modest ability for predicting the neuropsychological conclusion of the Left Hemispheric Function (V44). Its main strength is for correctly identifying instances of non-deficiency in V44 (68.7%).

Although this function made slightly fewer correct identifications than the corresponding function based only on MDPI rater observations and conclusions, we note that the current function was constructed from 131 cases and predicted to a set containing 201 cases, an increase of 70 cases. The other function was constructed from 170 cases and predicted to a set containing 201 cases, an increase of only 31 cases. Thus, the slight decrease in correct predictions is reasonable to expect. The improved strength of the function will be seen below in its increased values for Wilks' lambda and the canonical correlation.

The existence of a relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$\chi^2_1 = 14.30, \ p < .001.$$

That the discriminant function has only modest discriminating power is evidenced by its Wilks' lambda value of .8252 and a significant chi-square value of

$$\chi^2_9 = 23.9, \ p < .005.$$

The canonical correlation coefficient's value of .4181 indicates that the group variable and the discriminant function have a modest relationship. The square of this coefficient indicates that only 17.5% of the variance in the group variable is

A.3.4.1 Discriminant Analysis of Left Hemispheric Function (V44) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

Variable	Nomenclature	Discriminant Function Coefficient Standardized	Discriminant Function Coefficient Unstandardized
V108	Order of Numbers	-0.362	-0.832
V109	Mathematics Symbolism: Summary	0.552	0.975
V113	Fractional Numbers	-0.594	-0.486
V116	Shapes	-0.597	-1.511
V123	Subtraction Facts	0.583	0.666
V125	Division Facts	-0.528	-0.537
V137	Money	-0.688	-1.758
V152	Procedures with Integers	0.479	1.013
V196	Attentional Functioning	-0.293	-0.381
(Constant)			7.828

A.3.4.2 Discriminant Analysis of Left Frontal Function (V46) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 110 cases distributed on the group variable as follows:

42 cases having Code 1
(Deficiency -- less than adequate functioning.)

68 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 11 variables and provided correct classification for 70% of the 201 cases having data for the group variable. A table of these results follows:

V46 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	42 (62.7%)	98 (73.1%)	69.65%
Incorrectly identified:	25 (37.3%)	36 (26.9%)	

This discriminant function has considerable ability for predicting the neuropsychological conclusion concerning the Left Frontal Function (V46). However, the inclusion of the MDPI subtopics adds little discriminatory power over using just the MDPI rater observations and conclusions.

The relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square

A.3.4.2 Discriminant Analysis of Left Frontal Function (V46) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

test which yields

$$\underline{x_1^2 = 24.14,\ p < .001}.$$

That the discriminant function has very strong discriminating power is evidence by its Wilks' lambda value of .5993 and a highly significant chi-square value of

$$\underline{x_{11}^2 = 52.5,\ p < .0001}.$$

The canonical correlation coefficient's value of .6330 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 40.1% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.4.2 Discriminant Analysis of Left Frontal Function (V46) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	 Unstandardized
V111	Reversals in Digits	-0.237	-1.254
V114	Decimals	0.352	0.518
V123	Subtraction Facts	0.690	0.946
V144	Division of Fractions	-0.680	-1.013
V153	Algebra Skills	0.410	0.630
V167	Sequences	0.400	0.420
V173	Achievement at Grade Level	-0.415	-0.521
V186	Visual Memory	-0.933	-1.233
V193	Organizational Skills	0.412	0.551
V195	Precision of Responses	-0.524	-0.632
V204	Flexibility in Approaches	0.598	1.433
(Constant)			4.501

A.3.4.3 Discriminant Analysis of Right Frontal Function (V47) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 130 cases distributed on the group variable as follows:

48 cases having Code 1
(Deficiency -- less than adequate functioning.)

82 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 15 variables and provided correct classification for 73% of the 201 cases having data for the group variable. A table of these results follows:

V47 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	45 (70.3%)	102 (74.5%)	73.13%
Incorrectly identified:	19 (29.7%)	35 (25.5%)	

This discriminant function has a strong ability for predicting the neuropsychological conclusion concerning the Right Frontal Function (V47). However, the inclusion of the MDPI subtopics adds little discriminating power over using just the MDPI rater observations and conclusions.

The relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square

A.3.4.3 Discriminant Analysis of Right Frontal Function (V47) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

test which yields

$$x^{2}_{1} = 36.48, \ p < .0001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .6835 and a highly significant chi-square value of

$$x^{2}_{15} = 45.9, \ p < .0001.$$

The canonical correlation coefficient's value of .5626 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 31.7% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.4.3 Discrimininant Analysis of Right Frontal Function (V47) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficient Standardized	Discriminant Function Coefficient Unstandardized
V126	Compensatory Strategies in the Recall of Facts	-0.369	-0.542
V163	Problem Solving Intuitions and Strategies: Summary	0.212	0.312
V173	Achievement at Grade Level	-0.694	-0.901
V183	Memory for Multi-Step Procedures	0.531	0.547
V184	Memory for Directions	-0.277	-0.361
V186	Visual Memory	-0.464	-0.602
V188	Spontaneous Self-Structuring	0.324	0.415
V199	Need for Reauditorization Techniques	0.349	0.694
V200	Impulsivity	0.241	0.651
V204	Flexibility in Approaches	0.354	0.835
V206	Mathematics Learning Style I Operative	0.406	4.638
V208	Mathematics Learning Style I Preferred	-0.518	-1.141
V210	Mathematics Learning Style I Impaired	-0.493	-1.081
V212	Behavioral Considerations	0.266	0.537
V214	Need for Extraneous Conversation	-0.629	-1.923
(Constant)			-2.850

A.3.4.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 99 cases distributed on the group variable as follows:

40 cases having Code 1
(Deficiency -- less than adequate functioning.)

59 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 12 variables and provided correct classification for 69% of the 199 cases having data for the group variable. A table of these results follows:

V70 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	49 (65.3%)	88 (71.0%)	68.84%
Incorrectly identified:	26 (34.7%)	36 (29.0%)	

This discriminant function has considerable ability for predicting the neurological conclusion concerning the Left Hemispheric Function (V70). It shows only slight improvement in overall correct prediction over using just MDPI subtopics or using just MDPI rater observations and conclusions. Note that MDPI subtopics showed greater strength for predicting correctly within the non-deficiency category (75.8%).

A.3.4.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

The existence of a strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$x^2_{1} = 25.17, \ p < .001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .6623 and a highly significant chi-square value of

$$x^2_{13} = 37.3, \ p < .0005.$$

The canonical correlation coefficient's value of .5811 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 33.8% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.4.4 Discriminant Analysis of Left Hemispheric Function (V70) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	Unstandardized
V106	Proficiency with Continuous Models	0.270	0.362
V110	Whole Numbers	0.363	0.607
V111	Reversals in Digits	-0.480	-2.448
V130	Subtraction with Regrouping	0.607	0.569
V135	Addition of Fractions with Same Denominators	-0.307	-0.313
V167	Sequences	0.559	0.593
V175	Overall "Math Sense"	-0.458	-0.654
V177	Attention to Detail	-0.440	-0.880
V198	Need for Manipulative Materials	0.506	1.022
V200	Impulsivity	-0.375	-1.116
V203	Diversity in Approaches	0.308	0.723
V214	Need for Extraneous Conversation	0.349	1.210
(Constant)			5.420

A.3.4.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 119 cases distributed on the group variable as follows:

48 cases having Code 1
(Deficiency -- less than adequate functioning.)

71 cases having Code 2
(No deficiency -- at least adequate functioning.)

The optimal linear discriminant function for this analysis contained 14 variables and provided correct classification for 66% of the 199 cases having data for the group variable. A table of these results follows:

	V71 Actual Group		
	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	47 (63.5%)	84 (67.2%)	65.83%
Incorrectly identified:	27 (36.5%)	41 (32.8%)	

This discriminant function has a modest ability for predicting the neurological conclusion concerning the Right Hemispheric Function (V71). It shows only slight improvement in overall correct prediction over using just MDPI subtopics or using just MDPI rater observations and conclusions.

The above results are a measure of generalizability in that only 119 cases were used to construct the function while the above predictions were extended to 199 cases. In relation to the 119

A.3.4.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

cases from which the function was constructed, much greater strength was demonstrated as seen below.

The existence of a relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$x^2_1 = 17.78, \quad p < .001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .6520 and a highly significant chi-square value of

$$x^2_{14} = 47.0, \quad p < .0001.$$

The canonical correlation coefficient's value of .5899 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 34.8% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.4.5 Discriminant Analysis of Right Hemispheric Function (V71) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficient Standardized	Discriminant Function Coefficient Unstandardized
V109	Mathematics Symbolism: Summary	0.427	0.796
V131	Multiplication with One-Digit Multiplier	-0.410	-0.326
V141	Subtraction of Fractions with Different Denominators	-0.642	-0.773
V151	Concepts of Integers	0.532	1.385
V180	Anticipated Math Growth	0.424	0.625
V181	Memory Skills: Summary	0.539	0.722
V186	Visual Memory	0.447	0.584
V195	Precision of Responses	0.324	0.399
V196	Attentional Functioning	-0.371	-0.496
V197	Ability to Learn New Skills/Procedures	-0.269	-0.541
V200	Impulsivity	0.296	0.787
V201	Perseveration	-0.275	-0.650
V203	Diversity in Approaches	-0.495	-1.209
V209	Mathematics Learning Style II Preferred	0.366	0.872
(Constant)			-7.348

A.3.5 Discriminant Analysis of Area 5

The two subsections of this section contain the details of discriminant analyses used to predict the MDPI rater conclusions from the MDPI rater observations (V173 to V214). Note that variable V205 was eliminated due to excessive missing data. Also, variables V206 to V211 were excluded from the analysis since they contained MDPI rater conclusions (predictions) rather than rater observations.

A.3.5.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Preferred (V208) Using MDPI Rater Observations as Discriminating Variables

The discriminant function was created using 139 cases distributed on the group variable as follows:

43 cases having Code 1
(Mathematics Learning Style I not preferred.)

96 cases having Code 2
(Mathematics Learning Style I preferred.)

The optimal linear discriminant function for this analysis contained nine variables and provided correct classification for 69% of the 178 cases having data for the group variable. A table of these results follows:

V208 Actual Group

	Not Preferred	Preferred	Total % Correctly Identified
Correctly identified:	37 (67.3%)	86 (69.9%)	69.10%
Incorrectly identified:	18 (32.7%)	37 (30.1%)	

A.3.5.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Preferred (V208) Using MDPI Rater Observations as Discriminating Variables, (Cont'd.)

This discriminant function has a strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style I was preferred (V208).

The existence of a strong relationship between the actual group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$\chi^2_1 = 21.64, \ p < .001.$$

That the discriminant function has strong discriminating power is evidenced by its Wilks' lambda value of .7256 and a highly significant chi-square value of

$$\chi^2_9 = 42.5, \ p < .0001.$$

The canonical correlation coefficient's value of .5238 indicates that the group variable and the discriminant function have a strong relationship. The square of this coefficient indicates that 27.4% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.5.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Preferred (V208) Using MDPI Rater Observations as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	Unstandardized
V174	Development (Maturity) Findings	0.207	0.554
V175	Overall "Math Sense"	-0.231	-0.333
V192	Production of Responses	0.512	0.887
V195	Precision of Responses	0.664	0.844
V196	Attentional Functioning	0.490	0.661
V197	Ability to Learn New Skills/Procedures	-0.204	-0.384
V200	Impulsivity	0.366	0.971
V203	Diversity in Approaches	-0.444	-1.053
V213	Need for Extraneous Physical Activity	0.638	1.552
(Constant)			-9.549

A.3.5.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Rater Observations as Discriminating Variables

The discriminant function was created using 140 cases distributed on the group variable as follows:

106 cases having Code 1
(Mathematics Learning Style II not preferred.)

34 cases having Code 2
(Mathematics Learning Style II preferred.)

The optimal linear discriminant function for this analysis contained 10 variables and provided correct classification for 70% of the 178 cases having data for the group variable. A table of these results follows:

V209 Actual Group

	Not Preferred	Preferred	Total % Correctly Identified
Correctly identified:	99 (73.9%)	26 (59.1%)	70.22%
Incorrectly identified:	35 (26.1%)	18 (40.9%)	

This discriminant function has a strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style II was preferred (V209). Its greatest strength is for correctly identifiying those children who don't prefer Mathematics Learning Style II, (74%). This is valuable for preventing false labeling which could imply the need for certain alternative instruction.

The existence of a relationship between the actual group

A.3.5.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Rater Observations as Discriminating Variables, (Cont'd.)

membership and the predicted group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$\underline{x^2_1 = 15.99,\ p < .001}.$$

Although this discriminant function appears to have considerable strength when used to classify all cases having data for the group variable, it appears to be much weaker with respect to the data from which it was constructed.

The discriminant function has only modest discriminating power as evidenced by its Wilks' lambda value of .8300 with a significant chi-square value of

$$\underline{x^2_{10} = 24.8,\ p < .006}.$$

The canonical correlation coefficient's value of .4123 indicates that the group variable and the discriminant function have a modest relationship. The square of this coefficient indicates that only 17% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.5.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Rater Observations as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients Standardized	 Unstandardized
V175	Overall "Math Sense"	-0.489	-0.708
V192	Production of Responses	0.481	0.801
V194	Integration of Multi-Step Procedures	-0.315	-0.382
V195	Precision of Responses	0.468	0.576
V199	Need for Reauditorization Techniques	0.437	0.878
V200	Impulsivity	0.312	0.825
V201	Perseveration	-0.501	-1.176
V202	Ability to Respond to Complexity	0.364	0.820
V204	Flexibility in Approaches	-0.402	-0.906
V213	Need for Extraneous Physical Activity	0.306	0.756
(Constant)			-2.961

A.3.6 Discriminant Analysis of Area 6

The two subsections of this section contain the details of discriminant analyses used to predict the MDPI rater conclusions from the MDPI subtopics and rater observations (V100 to V214). Note that the following variables were eliminated due to excessive missing data: V138, V139, V146, V149, V150, V155, V159 to V162, V166, V168 to V172, and V205. Also variables V206 to V211 were eliminated since they contained MDPI rater conclusions (predictions).

A.3.6.1 Discriminant Analysis of the MDPI Rater Conclusion of: Mathematics Learning Style I Preferred (V208) Using MDPI Subtopics and Rater Observations as Discriminating Variables

The discriminant function was created using 120 cases distributed on the group variable as follows:

32 cases having Code 1
(Mathematics Learning Style I not preferred.)

88 cases having Code 2
(Mathematics Learning Style I preferred.)

The optimal linear discriminant function for this analysis contained 13 variables and provided correct classification for 80% of the 178 cases having data for the group variable. A table of these results follows:

V208 Actual Group

	Not Preferred	Preferred	Total % Correctly Identified
Correctly identified:	43 (78.2%)	100 (81.3%)	80.34%
Incorrectly identified:	12 (21.8%)	23 (18.7%)	

A.3.6.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Preferred (V208) Using MDPI Subtopics and Rater Observations as Discriminating Variables (Cont'd.)

This discriminant function has a very strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style I was preferred (V208).

However, this function requires 3 more discriminating variables than the corresponding function created from MDPI subtopics, yet provides almost no increase in percentage of correct identifications.

The existence of a strong relationship between the actual group membership and the predicted group membership for the above data is readily established by the chi-square test which yields

$$x^2_1 = 57.64, \ p < .0001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .5455 and a highly significant chi-square value of

$$x^2 = 67.6, \ p < .0001.$$

The canonical correlation coefficient's value of .6742 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 45.5% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.6.1 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style I Preferred (V208) Using MDPI Subtopics and Rater Observations as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficient Standardized	Unstandardized
V106	Proficiency with Continuous Models	-0.413	-0.623
V107	Place Value Concepts	0.390	0.668
V112	Reversals of Place Values	0.345	1.153
V115	Operational Signs	0.231	0.662
V156	Appreciation of Detail	0.505	0.644
V157	Appreciation of Overall Configuration	-0.777	-0.941
V163	Problem Solving Intuitions and Strategies: Summary	-0.293	-0.488
V165	Applications to Real-Life Situations	-0.239	-0.444
V195	Precision of Responses	0.463	0.610
V196	Attentional Functioning	0.473	0.619
V200	Impulsivity	0.223	0.583
V203	Diversity in Approaches	-0.295	-0.716
V213	Need for Extraneous Physical Activity	0.418	1.024
(Constant)			-8.691

A.3.6.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables

The discriminant function was created using 130 cases distributed on the group variable as follows:

100 cases having Code 1
(Mathematics Learning Style II not preferred.)

30 cases having Code 2
(Mathematics Learning Style II preferred.)

The optimal linear discriminant function for this analysis contained 17 variables and provided correct classification for 81% of the 178 cases having data for the group variable. A table of these results follows:

V209 Actual Group

	Deficiency	No Deficiency	Total % Correctly Identified
Correctly identified:	112 (83.6%)	33 (75.0%)	81.46 %
Incorrectly identified:	22 (16.4%)	11 (25.0%)	

This discriminant function has a very strong ability for predicting the MDPI rater conclusion concerning whether or not Mathematics Learning Style II was preferred (V209).

However, this function requires 5 more discriminating variables than the corresponding function created from MDPI subtopics, yet provides only about 3% increase in correct identifications.

The existence of a very strong relationship between the actual

A.3.6.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

group membership and the predicted group membership for the above data (with table rearranged accordingly) is readily established by the chi-square test which yields

$$x_1^2 = 53.24, \ p < .0001.$$

That the discriminant function has very strong discriminating power is evidenced by its Wilks' lambda value of .5475 and a highly significant chi-square value of

$$x_{17}^2 = 72.0, \ p < .0001.$$

The canonical correlation coefficient's value of .6727 indicates that the group variable and the discriminant function have a very strong relationship. The square of this coefficient indicates that 45.3% of the variance in the group variable is explained by the linear combination of the discriminating variables that appear in the discriminant function.

The standardized and unstandardized coefficients of the discriminant function appear below. The magnitudes of the standardized coefficients indicate the relative contributions of the associated variables to the function but are also related to their intercorrelations. Thus, we must be aware that the magnitudes could change drastically if one or more variables were added to or deleted from the function.

A.3.6.2 Discriminant Analysis of the MDPI Rater Conclusion of Mathematics Learning Style II Preferred (V209) Using MDPI Subtopics and Rater Observations and Conclusions as Discriminating Variables, (Cont'd.)

Variable	Nomenclature	Discriminant Function Coefficients	
		Standardized	Unstandardized
V105	Proficiency with Discrete Models	0.332	0.427
V106	Proficiency with Continuous Models	-0.342	-0.518
V109	Mathematics Symbolism: Summary	0.841	1.521
V110	Whole Numbers	-0.378	-0.637
V114	Decimals	-0.549	-0.763
V116	Shapes	-0.448	-1.430
V122	Addition Facts	-0.369	-0.593
V154	Geometry: Summary	0.534	0.905
V156	Appreciation of Detail	0.377	0.495
V157	Appreciation of Overall Configuration	-1.012	-1.211
V163	Problem Solving Intuitions and Strategies: Summary	-0.344	-0.551
V192	Production of Responses	0.246	0.481
V195	Precision of Responses	0.193	0.247
V199	Need for Reauditorization Techniques	0.322	0.647
V202	Ability to Respond to Complexity	0.211	0.476
V204	Flexibility in Approaches	-0.352	-0.781
V213	Need for Extraneous Physical Activity	0.304	0.767
(Constant)			4.797

A.3.7 Summary of the Results of Section 3

The results presented throughout Section 3 are now summarized in the following table so that the reader may easily compare the effects of the various sets of predictor variables on the individual group variables by reading across the rows of the table.

The entries in the table each contain the number of variables used in the final discriminant function, followed by the overall percentage of correct prediction for the function. It is clear that the MDPI rater observations and conclusions do not provide substantially more information than is already contained in the MDPI subtopics, except in the cases of V46 and V47 where the MDPI subtopics were very poor predictors.

The MDPI subtopics provided a higher percentage (68.3% vs. 62.2%) of correct classifications for the neurological conclusion concerning the Left Hemispheric Function (V70) than for the corresponding neuropsychological conclusion (V44).

The best classification results for each of the neuropsychological and neurological group variables fell in the range from 65.8% to 73.1%. The best classification results for each of the MDPI rater conclusion variables fell in the range from 77.3% to 81.5%. Such results are particularly encouraging since this study, while only at the exploratory stage, has done classification predictions at a more general level. Most exploratory studies in discriminant analysis involve constructing discriminant functions from a given sample of cases and then making classification predictions for that same sample. Confirmatory studies are then conducted, applying such discriminant functions to totally new samples of subjects. The approach used in the current study was somewhere between these two stages. Cases with missing data for any of the discriminating variables, for a given function, were excluded from the sample used in constructing the discriminant function but included in the sample used for classification predictions (as long as they had data for the group variable). Missing data instances were replaced by group means for the respective variables. The merit or this approach is to add generality, approaching cross validation, to the functions. The disadvantage of this approach is that the "correct classification" rates were slightly lower

A.3.7 Table Summarizing Results of Section 3

Group Variable	MDPI Subtopics V100 to V172	MDPI Rater Observations V173 to V214	MDPI Subtopics and Rater Observations V100 to V214
V44: Left Hemispheric Function - Neuropsychological	9 -- 62.2%	5 -- 66.2%	9 -- 63.2%
V45: Right Hemispheric Function - Neuropsychological	*	*	*
V46: Left Frontal Function - Neuropsychological	***	14 -- 69.2%	11 -- 69.7%
V47: Right Frontal Function - Neuropsychological	****	14 -- 71.6%	15 -- 73.1%
V70: Left Hemispheric Function - Neurological	11 -- 68.3%	11 -- 67.8%	12 -- 68.8%
V71: Right Hemispheric Function - Neurological	9 -- 61.8%	12 -- 63.3%	14 -- 65.8%
V72: Left Frontal Function - Neurological	*	*	*
V73: Right Frontal Function - Neurological	*	*	*
V208: Mathematics Learning Style I Preferred	10 -- 79.2%	9 -- 69.1%	13 -- 80.3%
V209: Mathematics Learning Style II Preferred	12 -- 78.7%	10 -- 70.2%	17 -- 81.5%
V210: Mathematics Learning Style I Impaired	2 -- 80.4%	**	**
V211: Mathematics Learning Style II Impaired	12 -- 77.3%	**	**

* Eliminated from analysis due to poor distribution of the group variable. Almost all children (cases) received the same score.

** Columns 2 and 3 of this table were not called for in the grant proposal, and although many of these analyses have been included, these four were not included.

*** This discriminant function was eliminated since its chi-square value was not significant (p = .07). The MDPI subtopics did not show strong predictive value for V46.

**** This discriminant function was eliminated since its chi-square value was not significant (p = .06). The MDPI subtopics did not show strong predictive value for V47.

than they would have been had such cases been excluded from the sample. A number of functions were compared both ways, and the inclusion of the extra cases generally reduced the "correct classification" rate by five to seven percentage points. Thus, there are grounds for being optimistic that a follow-up confirmatory study would produce similar results.

An exploratory discriminant analysis study conducted by Swier-Swiercinsky and Warnock[1] on 260 adults, of which 182 were diagnosed as brain damaged produced a 72.7% "correct classification" rate in identifying brain damaged vs. non brain damaged subjects. They also used a multiple linear discriminant function to predict type of brain damage. For their multiple linear discriminant function using a maximum battery of 21 variables from the WAIS (Wechsler Adult Intelligence Scale), the TPT (Tactical Performance Test), and other tests, the percentages of correct predictions were:

Non brain damaged - 65.4%

Left brain damaged - 63.6%

Right brain damaged - 52.9%

Diffuse brain damage - 51.7%

Note that the expected success rate by chance would only be 25% for each of the 4 categories.

Although the two studies are not exactly comparable, they both suggest that the discriminant function approach has strong potential in this area, and that further development may qualify it as an efficient and economical alternative to the neurological and neuropsychological examination processes.

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[1] Swiercinsky, D.P. & Warnock, J.K. Comparison of the Neuropsychological Key and Discriminant Analysis Approaches in Predicting Cerebral Damage and Localization. Journal of Counseling and Clinical Psychology, 1977, 45, 808-814.

As a final summary for this section, the following table presents a list of all MDPI variables and their involvement in discriminant functions for associated group variables. Since the group variables V44, V46, V47, V70, V71, V208, and V209 were involved in three separate runs involving first the discriminating variables V100 to V172, then V173 to V214 and finally the entire spread of V100 to V214, each of the discriminating variables had the potential of appearing twice for each of the seven group variables. Since V210 and V211 were only involved in one run with the discriminating variables V100 to V172, these discriminating variables had the potential of appearing only once for these two group variables.

The charts which follow use the code that an "X" indicates that a particular discriminating variable was used in a discriminant function for the group variable listed at the top of the respective column and became one of the optimal linear discriminant functions for that analysis. (The double "X's" indicate that it appeared twice.) A dash (--) indicates that for some reason, usually excessive missing data, the discriminating variable was excluded from the analysis. The blanks indicate that the particular variable was used in the discriminant function but did not become one of the optimal linear discriminant functions for that analysis. The table serves as an overview of the role each variable played in the discriminant analysis portion of the study.

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V100 - Number Concepts: Summary									
V101 - Counting Forward									
V102 - Counting Backwards							X		
V103 - Skip Counting				X					
V104 - Concept of Quantity									
V105 - Proficiency with Discrete Models (Sets)							XX		X

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left. Hem Function	V46 Left Fron-tal Funct.	V47 Rt. Fron-tal Funct.	V70 Left. Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V106 - Proficiency with Continuous Models (Rods)				XX		XX	XX		
V107 - Place Value Concepts						XX			
V108 - Order of Numbers	XX								X
V109 - Mathematics Symbolism: Summary	XX				XX		XX		
V110 - Whole Numbers				XX			XX		
V111 - Reversals in Digits		X		XX					

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left. Hem Function	V46 Left Frontal Func.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V112 - Reversals in Place Value					X	XX			
V113 - Fractional Numbers	XX			X					
V114 - Decimals		X					XX		X
V115 - Operational Signs					X	XX			
V116 - Shapes	XX			X		X	XX		
V117 - Arithmetic: Summary					X			X	

A.3.7.1 Table Using All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left. Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V118 - Addition Concepts									
V119 - Subtraction Concepts									
V120 - Multiplication Concepts									X
V121 - Division Concepts					X				
V122 - Addition Facts							XX		
V123 - Subtraction Facts	XX	X							

A.3.7.1 Table Using All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V124 - Multiplication Facts						X			
V125 - Division Facts	XX								X
V126 - Compensatory Strategies in the Recall of Facts			X						
V127 - Addition Without Regrouping									
V128 - Addition With Regrouping									
V129 - Subtraction Without Regrouping									X
V130 - Subtraction With Regrouping	X			XX					

A.3.7.1 Table Using All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V131 - Multiplication With One-Digit Multiplier					XX				X
V132 - Multiplication With Two-Digit Multiplier									X
V133 - Division With One-Digit Divisor				X					
V134 - Division With Two-Digit Divisor									
V135 - Addition of Fractions With Same Denominator				XX					

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left. Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Func.	V70 Left Hem. Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V136 - Addition of Fractions with Different Denominators									
V137 - Money	XX								
V140 - Subtraction of Fractions with Same Denominators									
V141 - Subtraction of Fractions with Different Denominators					XX				
V142 - Multiplication of Fraction Without Cancellation									

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V143 - Multiplication of Fractions With Cancellation									
V144 - Division of Fractions		X							X
V145 - Addition of Decimals									
V146 - Subtraction of Decimals	---	---	---	---	---	---	---	---	---
V147 - Multiplication of Decimals									
V148 - Divison of Decimals									X

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem. Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V149 - Mental Arithmetic	---	---	---	---	---	---	---	---	---
V150 - Estimation Skills	---	---	---	---	---	---	---	---	---
V151 - Concept of Integers					XX				
V152 - Procedures With Integers	XX								
V153 - Algebra Skills		X							
V154 - Geometry: Summary							XX	X	

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem. Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V155 - Figure/ Ground Discrimination	---	---	---	---	---	---	---	---	---
V156 - Appreciation of Detail					X	XX	XX		
V157 - Appreciation of Overall Configuration						XX	XX		
V158 - Organization Skills in Geometry									X
V159 - Geoboard Activities	---	---	---	---	---	---	---	---	---
V160 - Perceptual Imagination-Judgment	---	---	---	---	---	---	---	---	---

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V161 - 3-D Figures	---	---	---	---	---	---	---	---	---
V162 - Geometric Problem Solving	---	---	---	---	---	---	---	---	---
V163 - Problem Solving Intuitions and Strategies: Summary			X			XX	XX		X
V-164 - Pictorial Graphs				X					
V-165 - Applications to Real-Life Situations						XX			
V166 - Analogies	---	---	---	---	---	---	---	---	---
V167 - Sequences		X		XX					
V168 - Intuitive Functions	---	---	---	---	---	---	---	---	---

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLES	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Ft. Frontal Funct.	V70 Left Hem. Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V169 - Word Problems	---	---	---	---	---	---	---	---	---
V170 - Attributes of Sets: Creature Cards	---	---	---	---	---	---	---	---	---
V171 - Logic	---	---	---	---	---	---	---	---	---
V172 - Arithmetic: Problem Solving	---	---	---	---	---	---	---	---	---
V173 - Achievement at Grade Level		XX	XX	X					
V174 - Development (Maturity) Findings						X			
V175 - Overall "Math Sense"				XX		X	X		

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Func.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V176 - Sustaining Behavior				X					
V177 - Attention to Detail				XX					
V180 - Anticipated Math Growth					XX				
V181 - Memory Skills: Summary					XX				
V182 - Memory for Arithmetic Facts			X						
V183 - Memory for Multi-Step Procedures		X	XX						

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLES	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem. Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V184 - Memory for Directions		X	XX						
V185 - Memory for Pertinent Math Data		X							
V186 - Visual Memory		XX	XX	X	XX				
V187 - Self-Image									
V188 - Spontaneous Self-Structuring		X	XX						
V189 - Deliberateness									
V190 - Initiation of Procedures									

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct	V70 Left Hem. Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V191 - Implementation of Procedures	X	X							
V192 - Production of Responses						X	XX		
V193 - Organizational Skills	X	XX							
V194 - Integration of Multi-Step Procedures					X		X		
V195 - Precision of Responses		XX			XX	XX	XX		
V196 - Attentional Functioning	XX	X			XX	XX			

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style I Impaired
V197 - Ability to Learn New Skills/ Procedures		X			XX	X			
V198 - Need for Manipulative Mat'ls.				XX					
V199 - Need for Reauditorization Techniques			XX				XX		
V200 - Impulsivity	X		XX	XX	XX	X	X		
V201 - Perseveration					XX		X		
V202 - Ability to Respond to Complexity							XX		

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V201 Style I Impaired	V211 Style II Impaired
V203 - Diversity in Approaches				XX	XX	XX			
V204 - Flexibility in Approaches		XX	XX				XX		
V205 - Recognition of Pertinent Math Data	---	---	---	---	---	---	---	---	---
V206 - Mathematics Learning Style I Operative			XX		X				
V207 - Mathematics Learning Style II Operative									

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V208 - Mathematics Learning Style I Preferred		X	XX						
V209 - Mathematics Learning Style II Preferred					XX				
V210 - Mathematics Learning Style I Impaired			XX						
V211 - Mathematics Learning Style II Impaired									
V212 - Behavioral Considerations	X	X	XX	X					

A.3.7.1 Table Listing All MDPI Variables and Their Involvement in Discriminant Functions for Associated Group Variables

X	Variable was used and became a factor.
---	Variable was not used in this run.
(blank)	Variable was used, but did not become a factor.

DISCRIMINANT VARIABLE	GROUP VARIABLES								
	NEUROPSYCHOLOGICAL			NEUROLOGICAL		MATHEMATICS LEARNING STYLE			
	V44 Left Hem. Function	V46 Left Frontal Funct.	V47 Rt. Frontal Funct.	V70 Left Hem. Function	V71 Rt. Hem. Function	V208 Style I Preferred	V209 Style II Preferred	V210 Style I Impaired	V211 Style II Impaired
V213 - Need for Extraneous Physical Activity				X		XX	XX		
V214 - Need for Extraneous Conversation			XX	XX					

SECTION X

CODING KEY

- GENERAL DATA
- NEUROPSYCHOLOGICAL DATA
- NEUROLOGICAL DATA
- MATH PROFILE DATA

CODING KEY FOR N.I.E. GRANT

GENERAL DATA (Card 01 of 20)

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Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
1	1,2,3	Code Name		001-999	
2	4,5	Card Number		01 - 20	01
3	6	Sex	Male Female	1 2	
4	7,8	Month of Birth	January... December	01 12	
5	9,10	Date of Birth		01 - 31	
6	11,12	Year of Birth	1955... 1980	55 - 80	
7	13,14	Month of Evaluation	January... December	01 - 12	
8	15,16	Date of Evaluation		01 - 31	

CODING KEY FOR N.I.E. GRANT

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GENERAL DATA (Card 01 of 20, cont'd.)

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
9	17, 18	Year of Evaluation	1955... 1980	55 - 80	
10	19, 20	Chronological Age (Years) at Time of Evaluation		05 - 25	
11	21, 22	Chronological Age (Months) at Time of Evaluation		00 - 11	
12	23, 24	Grade in School	Kindergarten Gr. 1 - Gr. 8 High School Post High Sch. Ungraded	00 01 - 08 09 - 12 13 - 16 17	
13	25	Teacher-Reported Achievement in Mathematics	Delay > 1 yr. Delay < 1 yr. Appropriate Strong Variable Other No Data	1 2 3 4 5 6 9	

CODING KEY FOR N.I.E. GRANT

GENERAL DATA (Card 01 of 20, cont'd.)

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Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
14	26	Type of Standardized Math Test	Key Math	1	
			Stanford	2	
			SRA	3	
			WRAT	4	
			Other	5	
			No Data	9	
15	27	Level of Performance on Standardized Math Test	Delay > 1 yr.	1	
			Delay < 1 yr.	2	
			Appropriate	3	
			Strong	4	
			Variable	5	
			Other	6	
			No Data	9	
16	28	Teacher-Reported Achievement in Reading Comprehension	Delay > 1 yr.	1	
			Delay < 1 yr.	2	
			Appropriate	3	
			Strong	4	
			Variable	5	
			Other	6	
			No Data	9	

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GENERAL DATA (Card 01 of 20, cont'd.)

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
17	29	Teacher-Reported Achievement in Sight Vocabulary	Delay >1 yr.	1	
			Delay < 1 yr.	2	
			Appropriate	3	
			Strong	4	
			Variable	5	
			Other	6	
			No Data	9	
18	30	Teacher-Reported Achievement in Word Analysis	Delay >1 yr.	1	
			Delay < 1 yr.	2	
			Appropriate	3	
			Strong	4	
			Variable	5	
			Other	6	
			No Data	9	
19	31	Teacher-Reported Achievement in Spelling	Delay >1 yr.	1	
			Delay < 1 yr.	2	
			Appropriate	3	
			Strong	4	
			Variable	5	
			Other	6	
			No Data	9	

CODING KEY FOR N.I.E. GRANT

GENERAL DATA (Card 01 of 20, cont'd.)

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Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
20	32	Teacher-Reported Attentional Functioning	Significant Deficits	1	
			Some Deficits	2	
			Appropriate	3	
			Some Strengths	4	
			Significant Strengths	5	
			Other	6	
			No Data	9	
21	33	Teacher-Reported Perceptual Functioning	Significant Deficits	1	
			Some Deficits	2	
			Appropriate	3	
			Some Strengths	4	
			Significant Strengths	5	
			Other	6	
			No Data	9	

CODING KEY FOR N.I.E. GRANT

GENERAL DATA (Card 01 of 20, cont'd.)

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Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
22	34	Teacher-Reported Memory Function	Significant Deficits Some Deficits Appropriate Some Strengths Significant Strengths Other No Data	1 2 3 4 5 6 9	
23	35, 36, 37	WISC - R Score: Verbal	Score No Data	050 - 160 999	
24	38, 39, 40	WISC - R Score: Performance	Score No Data	050 - 160 999	
25	41, 42, 43	WISC - R Full Score	Score No Data	050 - 160 999	

CODING KEY FOR N.I.E. GRANT

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GENERAL DATA (Card 01 of 20, cont'd.)

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
26	44, 45	WISC - R Verbal Subtest: Information	Scaled Score No Data	00 - 20 99	
27	46, 47	WISC - R Verbal Subtest: Similarities	Scaled Score No Data	00 - 20 99	
28	48, 49	WISC - R Verbal Subtest: Arithmetic	Scaled Score No Data	00 - 20 99	
29	50,51	WISC - R Verbal Subtest: Vocabulary	Scaled Score No Data	00 - 20 99	
30	52,53	WISC - R Verbal Subtest: Comprehension	Scaled Score No Data	00 - 20 99	
31	54,55	WISC - R Verbal Subtest: Digit Span	Scaled Score No Data	00 - 20 99	
32	56,57	WISC - R Performance Subtest: Picture Completion	Scaled Score No Data	00 - 20 99	
33	58,59	WISC - R Performance Subtest: Picture Assembly	Scaled Score No Data	00 - 20 99	

CODING KEY FOR N.I.E. GRANT

GENERAL DATA (Card 01 of 20, cont'd.)

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ariable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
34	60,61	WISC - R Performance Subtest: Block Design	Scaled Score No Data	00 - 20 99	
35	62,63	WISC - R Performance Subtest: Object Assembly	Scaled Score No Data	00 - 20 99	
36	64,65	WISC - R Performance Subtest: Coding	Scaled Score No Data	00 - 20 99	
37	66, 67	Visual Motor Integration	Years	04 - 21	
38	68, 69	Test Score: Years followed by Months	Months No Data	00 - 11 99	
39	70, 71	Visual Motor Integration Test - Highest Item Score:	Years Months	04 - 21 00 - 11	
40	72, 73	(Years followed by Months)	No Data	9999	

CODING KEY FOR N.I.E. GRANT

NEUROPSYCHOLOGICAL DATA (Card 02 of 20)

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Standard Scales for Neuropsychology and Neurology

01 Data Implied Significant Compromise	11 Reported Significant Compromise
02 Data Implied Some Compromise	12 Reported Some Compromise
03 Data Implied Adequate	13 Reported Adequate
04 Data Implied Some Strength	14 Reported Some Strength
05 Data Implied Significant Strength	15 Reported Significant Strength
09 No Data	

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
41	1,2,3	Code Name		001-999	
42	4,5	Card Number		01 - 20	02
43	6	Level of Ability	Retarded Range	1	
			Borderline Avg.	2	
			Low Avg.	3	
			Avg.	4	
			Bright	5	
			Wide Scatter-Higher Scores on WISC Verbal	6	
			Wide Scatter-Higher Scores on WISC Performance	7	
			No Data	9	

CODING KEY FOR N.I.E. GRANT

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NEUROPSYCHOLOGICAL DATA (Card 02 of 20, cont'd.)

Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
44	7,8	Left Hemispheric Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
45	9,10	Right Hemispheric Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
46	11,12	Left Frontal Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
47	13,14	Right Frontal Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
48	15,16	Hemispheric Integration	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
49	17,18	Integration of Components	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
50	19,20	Organizational Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	

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NEUROPSYCHOLOGICAL DATA (Card 02 of 20, cont'd.)

Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
51	21,22	Attentional Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
52	23,24	Sequencing Skills	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
53	25,26	Output/Production Skills	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
54	27,28	Speed of Response Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
55	29,30	Language Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
56	31,32	Perseveration Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
57	33,34	Impulse Control	Standard Neuro Scales	01 - 05, 09 or 11 - 15	

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NEUROPSYCHOLOGICAL DATA (Card 02 of 20, cont'd.)

Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
58	35,36	Initiating Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
59	37,38	Sustaining Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
60	39,40	Inhibiting Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
61	41,42	Shifting Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
62	43,44	Developmental (Maturity) Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
63	45,46	Perceptual Memory	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
64	47,48	Linguistic Memory	Standard Neuro Scales	01 - 05, 09 or 11 - 15	

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NEUROPSYCHOLOGICAL DATA (Card 02 of 20, cont'd.)

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Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
65	49	Hyperactivity	No Yes Other	1 2 6	
66	50	Preferred Modality	Verbal Perceptual No Preference No Data	1 2 3 9	
67	51	General Memory Deficits	No Yes No Data	1 2 9	

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NEUROLOGICAL DATA (Card 03 of 20)

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Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
68	1,2,3,	Code Name		001-999	
69	4,5	Card Number		01 - 20	03
70	6,7	Left Hemispheric Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
71	8,9	Right Hemispheric Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
72	10,11	Left Frontal Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
73	12,13	Right Frontal Function	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
74	14,15	Hemispheric Integration	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
75	16,17	Integration of Components	Standard Neuro Scales	01 - 05, 09 or 11 - 15	

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NEUROLOGICAL DATA (Card 03 of 20, cont'd.)

Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
76	18,19	Organizational Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
77	20,21	Attentional Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
78	22,23	Sequencing Skills	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
79	24,25	Output/Production Skills	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
80	26,27	Speed of Response Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
81	28,29	Language Functioning	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
82	30,31	Perseveration Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
83	32,33	Impulse Control	Standard Neuro Scales	01 - 05, 09 or 11 - 15	

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NEUROLOGICAL DATA (Card 03 of 20, cont'd.)

Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
84	34,35	Initiating Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
85	36, 37	Sustaining Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
86	38,39	Inhibiting Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
87	40,41	Shifting Behavior Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
88	42,43	Developmental (Maturity) Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
89	44,45	Perceptual Memory	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
90	46,47	Linguistic Memory	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
91	48,49	Speed in Timed Motor Tests	Standard Neuro Scales	01 - 05, 09 or 11 - 15	

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NEUROLOGICAL DATA (Card 03 of 20, cont'd.)

Standard Scales for Neuropsychology and Neurology

01 Data Implied Significant Compromise	11 Reported Significant Compromise
02 Data Implied Some Compromise	12 Reported Some Compromise
03 Data Implied Adequate	13 Reported Adequate
04 Data Implied Some Strength	14 Reported Some Strength
05 Data Implied Significant Strength	15 Reported Significant Strength
09 No Data	

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
92	50, 51	Classical Neurological Findings	Standard Neuro Scales	01 - 05, 09 or 11 - 15	
93	52	Hyperactivity	No Yes Other	1 2 6	
94	53	Handedness	Right Left Mixed No Data	1 2 3 9	

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NEUROLOGICAL DATA (Card 03 of 20, cont'd.)

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Standard Scales for Neuropsychology and Neurology

01	Data Implied Significant Compromise	11	Reported Significant Compromise
02	Data Implied Some Compromise	12	Reported Some Compromise
03	Data Implied Adequate	13	Reported Adequate
04	Data Implied Some Strength	14	Reported Some Strength
05	Data Implied Significant Strength	15	Reported Significant Strength
09	No Data		

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
95	54	Footedness	Right Left Mixed No Data	1 2 3 9	
96	55	Eyedness	Right Left Mixed No Data	1 2 3 9	
97	56	Hyperactivity According to Connor's Rating Scale	No Yes No Data	1 2 9	

CODING KEY FOR N.I.E. GRANT

MATH PROFILE DATA (Card 04 of 20)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
98	1,2,3	Code Name		001-999	
99	4,5	Card Number		01 - 20	04
100	6,7	Number Concepts: Summary	Standard Math Scales	01 - 06, 09 or 11 - 16	
101	8,9	Counting Forward	Standard Math Scales	01 - 06, 09 or 11 - 16	
102	10,11	Counting Backwards	Standard Math Scales	01 - 06, 09 or 11 - 16	
103	12,13	Skip Counting	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 04 of 20, cont'd.)

Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
104	14,15	Concept of Quantity	Standard Math Scales	01 - 06, 09 or 11 - 16	
105	16,17	Proficiency with Discrete Models (Sets)	Standard Math Scales	01 - 06, 09 or 11 - 16	
106	18,19	Proficiency with Continuous Models (Rods)	Standard Math Scales	01 - 06, 09 or 11 - 16	
107	20,21	Place Value Concepts	Standard Math Scales	01 - 06, 09 or 11 - 16	
108	22,23	Order of Numbers	Standard Math Scales	01 - 06, 09 or 11 - 16	
109	24,25	Mathematics Symbolism: Summary	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 04 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

ariable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
110	26,27	Whole Numbers	Standard Math Scales	01 - 06, 09 or 11 - 16	
111	28,29	Reversals in Digits	Standard Math Scales	01 - 06, 09 or 11 - 16	
112	30,31	Reversals of Place Values	Standard Math Scales	01 - 06, 09 or 11 - 16	
113	32,33	Fractional Numbers	Standard Math Scales	01 - 06, 09 or 11 - 16	
114	34,35	Decimals	Standard Math Scales	01 - 06, 09 or 11 - 16	
115	36,37	Operational Signs	Standard Math Scales	01 - 06, 09 or 11 - 16	
116	38,39	Shapes	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 04 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
117	40,41	Arithmetic: Summary	Standard Math Scales	01 - 06, 09 or 11 - 16	
118	42,43	Addition Concepts	Standard Math Scales	01 - 06, 09 or 11 - 16	
119	44,45	Subtraction Concepts	Standard Math Scales	01 - 06, 09 or 11 - 16	
120	46,47	Multiplication Concepts	Standard Math Scales	01 - 06, 09 or 11 - 16	
121	48,49	Division Concepts	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 04 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
122	50,51	Addition Facts	Standard Math Scales	01 - 06, 09 or 11 - 16	
123	52,53	Subtraction Facts	Standard Math Scales	01 - 06, 09 or 11 - 16	
124	54,55	Multiplication Facts	Standard Math Scales	01 - 06, 09 or 11 - 16	
125	56,57	Division Facts	Standard Math Scales	01 - 06, 09 or 11 - 16	
126	58,59	Compensatory Strategies in the Recall of Facts	Standard Math Scales	01 - 06, 09 or 11 - 16	
127	60,61	Addition Without Regrouping	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 04 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

ariable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
128	62,63	Addition With Regrouping	Standard Math Scales	01 - 06, 09 or 11 - 16	
129	64,65	Subtraction Without Regrouping	Standard Math Scales	01 - 06, 09 or 11 - 16	
130	66,67	Subtraction With Regrouping	Standard Math Scales	01 - 06, 09 or 11 - 16	
131	68,69	Multiplication With One-Digit Multiplier	Standard Math Scales	01 - 06, 09 or 11 - 16	
132	70,71	Multiplication With Two-Digit Multiplier	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 04 of 20, cont'd.)

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Standard Scales for Math

01 Assumed No Competence
02 Assumed Significant Deficits
03 Assumed Some Deficits
04 Assumed Appropriate Responses
05 Assumed Better Than Expected
06 Assumed Area of Strength
09 No Basis for Assumption

11 Tested No Competence
12 Tested Significant Deficits
13 Tested Some Deficits
14 Tested Appropriate Responses
15 Tested Better Than Expected
16 Tested Area of Strength
19 Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
133	72,73	Division With One-Digit Divisor	Standard Math Scales	01 - 06, 09 or 11 - 16	
134	74,75	Division With Two-Digit Divisor	Standard Math Scales	01 - 06, 09 or 11 - 16	
135	76,77	Addition of Fractions With Same Denominators	Standard Math Scales	01 - 06, 09 or 11 - 16	
136	78,79	Addition of Fractions With Different Denominators	Standard Math Scales	01 - 06, 09 or 11 - 16	
137	80	Money	No Yes Other No Data	1 2 6 9	

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MATH PROFILE DATA (Card 05 of 20, cont'd.)

Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
138	1,2,3	Code Name		001-999	
139	4,5	Card Number		01 - 20	05
140	6,7	Subtraction of Fractions With Same Denominators	Standard Math Scales	01 - 06, 09 or 11 - 16	
141	8,9	Subtraction of Fractions With Different Denominators	Standard Math Scales	01 - 06, 09 or 11 - 16	
142	10,11	Multiplication of Fractions Without Cancellation	Standard Math Scales	01 - 06, 09 or 11 - 16	
143	12,13	Multiplication of Fractions With Cancellation	Standard Math Scales	01 - 06, 09 or 11 - 16	
144	14,15	Division of Fractions	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 05 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
145	16,17	Addition of Decimals	Standard Math Scales	01 - 06, 09 or 11 - 16	
146	18,19	Subtraction of Decimals	Standard Math Scales	01 - 06, 09 or 11 - 16	
147	20,21	Multiplication of Decimals	Standard Math Scales	01 - 06, 09 or 11 - 16	
148	22,23	Division of Decimals	Standard Math Scales	01 - 06, 09 or 11 - 16	
149	24,25	Mental Arithmetic	Standard Math Scales	01 - 06, 09 or 11 - 16	
150	26,27	Estimation Skills	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 05 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
151	28, 29	Concept of Integers	Standard Math Scales	01 - 06, 09 or 11 - 16	
152	30, 31	Procedures With Integers	Standard Math Scales	01 - 06, 09 or 11 - 16	
153	32, 33	Algebra Skills	Standard Math Scales	01 - 06, 09 or 11 - 16	
154	34, 35	Geometry: Summary	Standard Math Scales	01 - 06, 09 or 11 - 16	
155	36, 37	Figure/Ground Discrimination	Standard Math Scales	01 - 06, 09 or 11 - 16	
156	38, 39	Appreciation of Detail	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 05 of 20, cont'd.)

Standard Scales for Math

01 Assumed No Competence	11 Tested No Competence
02 Assumed Significant Deficits	12 Tested Significant Deficits
03 Assumed Some Deficits	13 Tested Some Deficits
04 Assumed Appropriate Responses	14 Tested Appropriate Responses
05 Assumed Better Than Expected	15 Tested Better Than Expected
06 Assumed Area of Strength	16 Tested Area of Strength
09 No Basis for Assumption	19 Test Given, Data Obscured

ariable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
157	40,41	Appreciation of Overall Configuration	Standard Math Scales	01 - 06, 09 or 11 - 16	
158	42,43	Organizational Skills in Geometry	Standard Math Scales	01 - 06, 09 or 11 - 16	
159	44,45	Geoboard Activities	Standard Math Scales	01 - 06, 09 or 11 - 16	
160	46,47	Perceptual Imagination/Judgment	Standard Math Scales	01 - 06, 09 or 11 - 16	
161	48,49	Three-Dimensional Figures	Standard Math Scales	01 - 06, 09 or 11 - 16	
162	50,51	Geometric Problem Solving	Standard Math Scales	01 - 06, 09 or 11 - 16	
163	52,53	Problem Solving Intuitions and Strategies: Summary	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 05 of 20, cont'd.)

Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
164	54,55	Pictorial Graphs	Standard Math Scales	01 - 06, 09 or 11 - 16	
165	56,57	Applications to Real-Life Situations	Standard Math Scales	01 - 06, 09 or 11 - 16	
166	58,59	Analogies	Standard Math Scales	01 - 06, 09 or 11 - 16	
167	60,61	Sequences	Standard Math Scales	01 - 06, 09 or 11 - 16	
168	62,63	Intuitive Functions	Standard Math Scales	01 - 06, 09 or 11 - 16	
169	64,65	Word Problems	Standard Math Scales	01 - 06, 09 or 11 - 16	
170	66,67	Attributes of Sets: Creature Cards	Standard Math Scales	01 - 06, 09 or 11 - 16	
171	68,69	Logic	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 05 of 20, cont'd.)

Standard Scales for Math

01 Assumed No Competence	11 Tested No Competence
02 Assumed Significant Deficits	12 Tested Significant Deficits
03 Assumed Some Deficits	13 Tested Some Deficits
04 Assumed Appropriate Responses	14 Tested Appropriate Responses
05 Assumed Better Than Expected	15 Tested Better Than Expected
06 Assumed Area of Strength	16 Tested Area of Strength
09 No Basis for Assumption	19 Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
172	70,71	Arithmetic Problem Solving	Standard Math Scales	01 - 06, 09 or 11 - 16	
173	72,73	Achievement at Grade Level	Standard Math Scales	01 - 06, 09 or 11 - 16	
174	74,75	Development (Maturity) Findings	Standard Math Scales	01 - 06, 09 or 11 - 16	
175	76,77	Overall "Math Sense"	Standard Math Scales	01 - 06, 09 or 11 - 16	
176	78,79	Sustaining Behavior Ability	Standard Math Scales	01 - 06, 09 or 11 - 16	
177	80	Attention to Detail	No Yes Other No Data	1 2 6 9	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

Standard Scales for Math

01 Assumed No Competence
02 Assumed Significant Deficits
03 Assumed Some Deficits
04 Assumed Appropriate Responses
05 Assumed Better Than Expected
06 Assumed Area of Strength
09 No Basis for Assumption

11 Tested No Competence
12 Tested Significnt Deficits
13 Tested Some Deficits
14 Tested Appropriate Responses
15 Tested Better Than Expected
16 Tested Area of Strength
19 Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
178	1,2,3	Code Name		001-999	
179	4,5	Card Number		01-20	
180	6,7	Anticipated Math Growth	Standard Math Scales	01 - 06, 09 or 11 - 16	
181	8,9	Memory Skills: Summary	Standard Math Scales	01 - 06, 09 or 11 - 16	
182	10,11	Memory for Arithmetic Facts	Standard Math Scales	01 - 06, 09 or 11 - 16	
183	12,13	Memory for Multi-Step Procedures	Standard Math Scales	01 - 06, 09 or 11 - 16	
184	14,15	Memory for Directions	Standard Math Scales	01 - 06, 09 or 11 - 16	
185	16,17	Memory for Pertinent Mathematical Data	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significnt Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
186	18,19	Visual Memory	Standard Math Scales	01 - 06, 09 or 11 - 16	
187	20,21	Self-Image	Standard Math Scales	01 - 06, 09 or 11 - 16	
188	22,23	Spontaneous Self-Structuring	Standard Math Scales	01 - 06, 09 or 11 - 16	
189	24,25	Deliberateness	Standard Math Scales	01 - 06, 09 or 11 - 16	
190	26,27	Initiation of Procedures	Standard Math Scales	01 - 06, 09 or 11 - 16	
191	28,29	Implementation of Procedures	Standard Math Scales	01 - 06, 09 or 11 - 16	
192	30,31	Production of Responses	Standard Math Scales	01 - 06, 09 or 11 - 16	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

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Standard Scales for Math

01	Assumed No Competence	11	Tested No Competence
02	Assumed Significant Deficits	12	Tested Significant Deficits
03	Assumed Some Deficits	13	Tested Some Deficits
04	Assumed Appropriate Responses	14	Tested Appropriate Responses
05	Assumed Better Than Expected	15	Tested Better Than Expected
06	Assumed Area of Strength	16	Tested Area of Strength
09	No Basis for Assumption	19	Test Given, Data Obscured

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
193	32,33	Organizational Skills	Standard Math Scales	01 - 06, 09 or 11 - 16	
194	34,35	Integration of Multi-Step Procedures	Standard Math Scales	01 - 06, 09 or 11 - 16	
195	36,37	Precision of Responses	Standard Math Scales	01 - 06, 09 or 11 - 16	
196	38,39	Attentional Functioning	Standard Math Scales	01 - 06, 09 or 11 - 16	
197	40,41	Ability to Learn New Skills/Procedures	Standard Math Scales	01 - 06, 09 or 11 - 16	
198	42	Need for Manipulative Materials	No Yes Other	1 2 6	
199	43	Need for Reauditorization Techniques	No Yes Other	1 2 6	
200	44	Impulsivity	No Yes Other	1 2 6	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

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Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
201	45	Perseveration	No Yes Other	1 2 6	
202	46	Ability to Respond to Complexity	No Yes Other No Data	1 2 6 9	
203	47	Diversity in Approaches	No Yes Other No Data.	1 2 2 9	
204	48	Flexibility in Approaches	No Yes Other No Data	1 2 6 9	
205	49	Recognition of Pertinent Math Data	No Yes Other No Data	1 2 2 9	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

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Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
206	50	Mathematics Learning Style I Operative	No Yes Other No Data	1 2 6 9	
207	51	Mathematics Learning Style II Operative	No Yes Other No Data	1 2 2 9	
208	52	Mathematics Learning Style I Preferred	No Yes Other No Data	1 2 2 9	
209	53	Mathematics Learning Style II Preferred	No Yes Other No Data	1 2 2 9	
210	54	Mathematics Learning Style I Impaired	No Yes Other No Data	1 2 2 9	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

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Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
211	55	Mathematics Learning Style II Impaired	No Yes Other No Data	1 2 2 9	
212	56	Behavioral Considerations	No Yes Other No Data	1 2 6 9	
213	57	Need for Extraneous Physical Activity	No Yes Other No Data	1 2 6 9	
214	58	Need for Extraneous Conversation	No Yes Other No Data	1 2 6 9	
215	59	Recommendations: Remediation Program	No Yes	1 2	
216	60	Recommendations: in Regular Classroom	No Yes	1 2	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

Variable No.	COLUMN	ITEM DESCRIPTION	Nomenclature	Code Equivalent	CODING
217	61	Recommendations: Outside Regular Classroom	No Yes	1 2	
218	62	Recommendations: On Individual (One-to-One) Basis	No Yes	1 2	
219	63	Recommendations: Supportive Program	No Yes	1 2	
220	64	Recommendations: Supportive Program in Regular Classroom	No Yes	1 2	
221	65	Recommendations: Supportive Program Outside Regular Classrm.	No Yes	1 2	
222	66	Recommendations: Supportive Program On Individual (One-to-One) Basis	No Yes	1 2	
223	67	Recommendations: Use of Discrete Models	No Yes No Data	1 2 9	
224	68	Recommendations: Use of Continuous Model	No Yes No Data	1 2 9	
225	69	Provision of Step-by-Step/ "Recipe" Approaches	No Yes No Data	1 2 9	
226	70	Provision of Estimation/ "Preview" Approaches	No Yes No Data	1 2 9	

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MATH PROFILE DATA (Card 06 of 20, cont'd.)

Variable No.	COLUMN	HISTORY	Nomenclature	Code Equivalent	CODING
227	71	Provision of Strong External Structuring	No Yes No Data	1 2 9	
228	72	Relaxation of Time Constraints	No Yes No Data	1 2 9	
229	73	Recommendation: Development of Compensatory Strategies for Recall Deficits	No Yes No Data	1 2 9	
230	74	Provision of Calculator	No Yes No Data	1 2 9	
231	75	Recommendation: Experiental Math Program	No Yes	1 2	
232	76	Recommendation: Math Program Determined by Life's Goals	No Yes	1 2	
233	77	Recommendation: Close Follow-up Evaluation (6 mos. - 1 yr.)	No Yes	1 2	
234	78, 79	Language Interference	Standard Math Scales	01 - 06, 09 or 11 - 16, 19	
235	80	Perceptual Judgment Problems	No Yes No Data	1 2 9	

SECTION XI

RATING MANUAL FOR CODING KEY

- GENERAL DATA
- NEUROPSYCHOLOGICAL DATA
- NEUROLOGICAL DATA
- MATHEMATICAL DATA
- MATHEMATICS FINDINGS

RATING MANUAL FOR CODING KEY FOR N.I.E. GRANT

GENERAL DATA (Card Number 01)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
1, 2, 3	Code Name	Pre-assigned and listed on outside of each folder.
4, 5	Card Number	01
6	Sex	Clear from name, photo, and pronouns used in the reports.
7, 8	Month of Birth	Listed in numerals on inside cover page of hospital file.
9, 10	Date of Birth	Listed in numerals on inside cover page of hospital file.
11, 12	Year of Birth	Listed in numerals on inside cover page of hospital file.
13, 14	Month of Evaluation	Listed in numerals at top of inside cover page of hospital file.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
15, 16	Date of Evaluation	Listed in numerals at top of inside cover page of hospital file.
17, 18	Year of Evaluation	Listed in numerals at top of inside cover page of hospital file.
19, 20	Chronological Age (Years) at Time of Evaluation	Explicit listing often given next to date of birth on inside cover. If not, compute by subtracting the year and month of date of birth from the year and month of date of evaluation, ignoring the specific days in the computation.
21, 22	Chronological Age (Months) at Time of Evaluation	
23, 24	Grade in School	Listed at top of inside cover of hospital file (or in exceptional cases when not given, mentioned on medical history sheet).

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
25	Teacher-Reported Achievement in Mathematics	Taken exclusively from teacher rating on School Data Checklist, Item 07 Arithmetic: Strong for Age, Appropriate for Age, Delayed Less Than One Year, Delayed More Than One Year.
26	Type of Standardized Math Test	If given, listed at bottom of inside cover page of hospital file with the date of administration given.
27	Level of Performance on Standardized Math Test	If given, listed at bottom of inside cover page of hospital file. Grade level score has to be synchronized with the grade in school at time of administration of the test which may not be the same date as the date of the hospital evaluation.
28	Teacher-Reported Achievement in Reading Comprehension	Taken exclusively from teacher rating on School Data Checklist, Item 01 Reading Comprehension. Strong for Age, Appropriate for Age, Delayed Less Than One Year, Delayed More Than One Year.

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GENERAL DATA (Card Number 01)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
29	Teacher-Reported Achievement in Sight Vocabulary	Taken exclusively from teacher rating on School Data Checklist -- item available only on subjects evaluated after January 1, 1978 when Checklist was revised.
30	Teacher-Reported Achievement in Word Analysis	Taken exclusively from teacher rating on School Data Checklist, Item 05 Word Analysis Skills: Strong for Age, Appropriate for Age, Delayed Less Than One Year, Delayed More Than One Year.
31	Teacher-Reported Achievement in Spelling	Taken exclusively from teacher rating on School Data Checklist Item 06. Spelling: Strong for Age, Appropriate for Age, Delayed Less Than One Year, Delayed More Than One Year.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
32	Teacher-Reported Attentional Functioning	Taken from listing of Strengths and Weaknesses on inside cover page of hospital file. Pertinent wordings indicating weaknesses include: - easily distracted - gets out of seat - too much energy - trouble finishing task - tunes out - hands and feet in motion (physical activity) - makes careless mistakes - short attention span - doesn't hear what is said - trouble concentrating

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
32 Cont'd.		Ratings: Significant Deficits, 1: If 2 or more of above are mentioned. Some Deficits, 2: If only 1 of above is mentioned. Appropriate, 3: If mentioned as being no problem. Some Strengths, 4: If mentioned as a strength. Significant Strength, 5: If mentioned as unusual strength. Other, 6: Rating used only if no other code applies. No Data, 9: Rating used if no mention is made or if inside cover sheet of hospital file is unavailable.
33	Teacher-Reported Perceptual Functioning	Taken from listing of Strengths and Weaknesses on inside cover page of hospital file. Pertinent wordings indicating areas of weaknesses include:

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
33 Cont'd.	Cont'd.	- Copying written materials - Orienting letters and numerals (reversals) - Discriminating similar sounds or words. - Visual memory - Loses place in reading - Visual tracking - Transferring sounds to symbols Ratings: Significant Deficits, 1: If 2 or more of above are mentioned as a problem. Some Deficits: If only 1 of above is mentioned as a problem. Appropriate, 3: If any of the areas are mentioned as no problem.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
33 Cont'd.	Cont'd.	Some Strengths, 4: If any 1 of the areas mentioned as a strength. Significant Strengths, 5: If 2 or more of the areas are mentioned as strengths. Other, 6: Rating used only if no other code applies. No Data, 9: Rating used if no mention is made or if inside cover sheet of hospital file is unavailable.
34	Teacher-Reported Memory Function	Taken from listing of Strengths and Weaknesses on inside cover page of hospital file. Pertinent wording indicating areas of weaknesses include:

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
34 Cont'd.	Cont'd.	- Retaining yesterday's lesson - Retaining skills - Following series of directions - Visual memory - Remembering routines Ratings: Significant Deficits, 1: If 2 or more of above are mentioned as a problem. Some Deficits: If only 1 of above is mentioned as a problem. Appropriate, 3: If any of the areas are mentioned as no problem. Some Strengths, 4: If any of the areas mentioned as a strength.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
34 Cont'd.	Cont'd.	Significant Strengths, 5: If 2 or more of the areas are mentioned as strengths. Other, 6: Rating used only if no other code applies. No Data, 9: Rating used if no mention is made or if inside cover sheet of hospital file is unavailable.
35, 36, 37	WISC-R Score: Verbal	If given prior to hospital evaluation, score is listed inside cover page of hospital file, with the date administered. If given more than once, take latest data
38, 39, 40	WISC-R Score: Performance	If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file, with the date administered. If given more than once, take latest data.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
41, 42, 43	WISC-R Full Score	If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file, with the date administered. If given more than once, take latest data.
44, 45	WISC-R Verbal Subtest: Information	If given as part of hospital evaluation, score is reported in the Neuropsychologist's report. If not given as part of hospital evaluation, look for score at bottom inside cover of hospital file. If in neither place, score as No Data, 99.
46, 47	WISC-R Verbal Subtest: Similarities	Not usually given as part of hospital evaluation; but if so, score will be reported in the Neuropsychologist's report. If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file. If given more than once, take latest data.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
48, 49	WISC-R Verbal Subtest: Arithmetic	Not usually given as part of hospital evaluation; but if so, score will be in the Neuropsychologist's report. If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file. If given more than once, take latest data.
50, 51	WISC-R Verbal Subtest: Vocabulary	If given as part of hospital evaluation, score is reported in the Neuropsychologist's report. If not given as part of hospital evaluation, look for score at bottom of inside cover of hospital file. If in neither place, score as No Data, 99.
52, 53	WISC-R Verbal Subtest: Comprehension	Not usually given as part of hospital evaluation; but if so, score will be reported in the Neuropsychologist's report. If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file. If given more than once, take latest data.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
54, 55	WISC-R Verbal Subtest: Digit Span	If given as part of hospital evaluation, score is reported in the Neuropsychologist's report. If not given as part of hospital evaluation, look for score at bottom inside cover of hospital file. If in neither place, score as No Data, 99.
56, 57	WISC-R Performance Subtest: Picture Completion	Not usually given as part of hospital evaluation; but if so, score will be reported in the Neuropsychologist's report. If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file. If given more than once, take latest data.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
58, 59	WISC-R Performance Subtest: Picture Assembly	Not usually given as part of hospital evaluation; but if so, score will be reported in the Neuropsychologist's report. If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file. If given more than once, take latest data.
60, 61	WISC-R Performance Subtest: Block Design	If given as part of hospital evaluation, score is reported in the Neuropsychologist's report. If not given as part of hospital evaluation, look for score at bottom inside cover of hospital file. If in neither place, score as No Data, 99.
62, 63	WISC-R Performance Subtest: Object Assembly	If given as part of hospital evaluation, score is reported in the Neuropsychologist's report. If not given as part of hospital evaluation, look for score at bottom inside cover of hospital file. If in neither place, score as No Data, 99.

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GENERAL DATA (Card Number 01)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
64, 65	WISC-R Performance Subtest: Object Assembly	Not usually given as part of hospital evaluation; but if so, score will be reported in the Neuropsychologist's report. If given prior to hospital evaluation, score is listed at bottom of inside cover of hospital file. If given more than once, take latest data.
66, 67 68, 69	Visual Motor Integration Rest Score: Years followed by Months	If given as part of hospital evaluation, score is reported in the Neuropsychologist's report.
70, 71 72, 73	Visual Motor Integration Test - Highest Item Score: (Years followed by Months)	The highest item score is typical of the overall test score, it will be discussed in the Neuropsychologist's report following the test score.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

General Interpretation of Standard Scales for Neurology

(Unless otherwise noted more explicitly for specific items below)

01	Data Implied Significant Compromise	(Two or more indications of compromise in Data/Findings of Neuropsycholgist's Report)
02	Data Implied Some Compromise	(One indication of compromise in Data/ Findings of Neuropsychologist's Report)
03	Data Implied Adequate	(No mention in Impressions or in Data/ Findings of Neuropsychologist's Report)
04	Data Implied Some Strength	(One indication of strength in Data/ Findings of Neuropsychologist's Report)
05	Data Implied Significant Strength	(Two or more indications of strength in Data/Findings of Neuropsychologist's Report)

RATING MANUAL FOR CODING KEY FOR N.I.E. GRANT NEUROPSYCHOLOGICAL DATA (Card Number 02)

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General Interpretation of Standard Scales for Neurology

(Unless otherwise noted more explicitly for specific items below)

09	No Data	(No neuropsychological data available)
11	Reported Significant Compromise	(Mention of Compromise with no qualification in Neuropsychologist's Report)
12	Reported Some Compromise	(Mention of "slight," "some," "subtle," or "stressed" in Impressions of Neuropsychologist's Report)
13	Reported Adequate	(Stated as "adequate" in Impressions of Neuropsychologist's Report)
14	Reported Some Strength	(Stated as "strength" in Impressions of Neuropsychologist's Report)
15	Reported Significant Strength	(Stated as "Area of Significant Strength" in Impressions of Neuropsychologist's Report)

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
1,2,3	Code Name	Pre-assigned and listed on outside of each folder.
4,5	Card Number	02
6	Level of Ability	Taken from statement in Impressions if available. If not available, WISC-R Subtests scores were used. Retarded Range, 1: Subtest Scores of 1, 2, or 3 with average < 3; no score ≥5. Borderline Average, 2: Subtest Scores of 4 or 5 with average < 5; no score ≥ 7. Low Average, 3: Subtest Scores of 6, 7 or 8 with average < 8; no score ≥10. Synonymous wording in Impressions: "below average," "limited cognitive function."

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
6 (Cont'd.	Cont'd.	Average, 4: Subtest Scores of 8, 9, or 10 with average < 9; no score ≥ 12. Bright, 5: Subtest Scores of 11 or above with average > 11. Wide Scatter - High Scores on WISC Verbal, 6: Used only if no other category appropriate. Verbal scores 5 or more points over Performance Scores. Wide Scatter - High Scores on WISC Performance, 7: Used only if no other category appropriate. Performance scores 5 or more points over Verbal Scores. No Data, 9: No information available.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
7,8	Left Hemispheric Function	11: Comment of "deficit" in Impressions not qualified. 12: Use of word "some," "slight," or "subtle" in comments about deficits in Impressions. 01: Language deficits on Verbal Subtests of WISC-R or noted in the Data/Findings of the Rey-Osterreich or Visual Motor Integration Tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
9, 10	Right Hemispheric Function	11: Comment of "deficit" in Impressions not qualified. 12: Use of word "some," "slight," or "subtle" in comments about deficits in Impressions. 01: Deficits on Performance Subtests of WISC-R or noted in the Data/Findings of the Rey Osterreich, Rey Osterreich Recall, or Visual Motor Integration Tests (size, proportion, repeated patterns, lack of overall configuration). 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
11, 12	Left Frontal Function	11: Two or more indications in Impressions (deficits in verbal output systems, bifrontal compromise, organizational deficits, deficits in ordering). 12: One of the above indications in Impressions or use of words "subtle" or "some deficits." 01: Two or more deficits noted to relate to a left frontal compromise in Data/Findings of the Rey Osterreich, Rey Osterreich Recall, Visual Motor Integration Tests." 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
13, 14	Right Frontal Function	11: Two or more indications in Impression (deficits in non-verbal output, bifrontal compromise). 12: One of the above indications in Impressions or use of words "subtle" or "some deficits." 01: Two or more deficits noted to relate to "right frontal compromise" in the Data/Findings of the Rey Osterreich, Rey Osterreich Recall, or Visual Motor Integration Tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
15, 16	Hemispheric Integration	11: Two or more indications in Impressions (corpus callosum function, midline function, integration of systems). 12: One of the above indications in Impressions or use of words "subtle" or "some deficits." 01: Two or more deficits noted to relate to dissociation of right and left side brain function in the Data/Findings of the Rey Osterreich, Rey Osterreich Recall, or Visual Motor Integration Tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
17, 18	Integration of Components	11: Two or more indications in Impressions ("no strategy to put together," "repetition of parts," "misplaced parts," continuity of patterns"). 12: One of the above indications in Impressions or use of words "subtle" or "some deficits." 01: Two or more deficits noted to relate to lack of integration of components in the Rey Osterreich, Rey Osterreich Recall, Visual Motor Integration, or Repeated Patterns Test. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
19,20	Organizational Functioning	11: Two or more indications in Impressions (rotations, orientation problems, disorganization). 12: One of the above indications in Impressions or use of words "subtle" or "some deficits." 01: Two or more deficits noted to relate to rotation and orientation problems in Rey Osterreich, Rey Osterreich Recall, Visual Motor Integration Test, or the Block Design Subtest of the WISC-R. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
21,22	Attentional Functioning	11: Two or more indications in Impressions or in General Behavior Comments (attractible, distractible, difficulty focusing, attentional problems). 12: One of the above indications in Impressions or, "General Behavior Comments." 01: Two or more deficits noted to relate to attentional problems in the Data/Findings of any of the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions, General Behavior Comments, or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
23, 24	Sequencing Skills	11: Two or more indications in Impressions (problems in sequencing, seduction to standard automatized series). 12: One of the above indications in Impressions or or use of words "subtle" or "some deficits." 01: Two or more deficits noted to relate to sequencing problems in Automatized Series and Digit Span Subtest of WISC-R. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
25, 26	Output/Production Skills	11: Two/or more indications in Impressions or in General Behavior Comments (output skills deficit, production problem). 12: One of the above indications in Impressions or in General Behavior Comments or use of words "subtle," or "some deficits." 01: Two or more deficits noted to relate to production skills in Rey Osterreich Recall, Visual Motor Integration Tests, or Information Subtest of WISC-R. 02: Only one of the above deficits. 03: No mention in Impressions, General Behavior Comments, or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
27,28	Speed of Response Functioning	11: Two or more indications in Impressions or in General Behavior Comments (speed of response, latency of response). 12: One of the above indications in Impressions or in General Behavior Comments. 03: No mention in Impressions, General Behavior Comments, or in Data/Findings.
29,30	Language Functioning	11: Two or more indications in Impressions or in General Behavior Comments (expressive deficits, processing deficits, language impaired, comprehension deficits, deficits in use of language, word finding problems). 12: One of the above indications in Impressions or in General Behavior Comments or use of words "subtle" or "some deficits."

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
29,30 Cont'd.	Cont'd.	01: Two or more deficits related to language functioning problems on WISC-R Verbal Subtests. 02: Only one of the above deficits. 03: No mention in Impressions, General Behavior Comments, or in Data/Findings.
31,32	Perseveration Findings	12: Specifically noted as "some" or "subtle" in Impressions. 01: Two or more indications of perseverative behavior in Automatized Series, Digit Span Tests, Rey Osterreich, or Visual Motor Integration Tests. 02: Deficits mentioned in only one of the above areas.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
32 Cont'd.	cont'd.	03: No mention in Impressions or in Data/Findings.
33,34	Impulse Control	13: Comment in Impressions or in General Behavior Comments to subject being "attentive" or "calm." 01: Two or more deficits related to impulsive or disinhibited behavior in the Data/Findings of any of the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions, General Behavior Comments, or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
35,36	Initiating Behavior Findings	01: Two or more deficits related to problems in starting a task or initiating behavior in the Data/Findings of any of the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions, General Behavior Comments, or in Data/Findings.
37,38	Sustaining Behavior Findings	01: Two or more deficits related to problems of "sustaining a task or behavior" or "maintaining a set" in the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions, General Behavior Comments, or in Data/Findings.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
39,40	Inhibiting Behavior Findings	11: Comment of "deficit" in Impressions not qualified. 12: Use of words "some" "slight," or "subtle" in comments about deficits in Impressions. 01: Two or more deficits noted to relate to verbal disinhibition, behavioral disinhibition, or disinhibition in the response pattern of a perceptual task in the Data/Findings of any of the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
41,42	Shifting Behavior Findings	11: Comment of "deficits" in Impressions not qualified. 12: Use of words "some," "slight," or "subtle" in comments about deficits in Impressions. 01: Two or more deficits noted to relate to "shifting behavior" or "changing a set" in the Data/Findings of any of the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
43,44	Developmental (Maturity) Findings	11: Comment of "deficits" in Impressions not qualified. 12: Use of words "some," "slight," or "subtle" in comments about deficits in Impressions. 01: Two or more deficits noted to relate to developmental immaturity in the Data/Findings of any of the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
45,46	Perceptual Memory	11: Comment of "deficit" in Impressions not qualified. 12: Use of words "some," "slight," or "subtle" in comments about deficits in Impressions. 01: Two or more deficits noted to relate to perceptual memory or memory in visuoconstructive tasks of the Block Design Subtest of the WISC-R, Rey Osterreich, Rey Osterreich Recall, or Visual Motor Integration Tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
47,48	Linguistic Memory	11: Comment of "deficit" in Impressions not qualified. 12: Use of words "some," "slight," or "subtle" in comments about deficits in Impressions. 01: Two or more deficits noted to relate to verbal memory in the Data/Findings of any of the neuropsychological tests. 02: Only one of the above deficits. 03: No mention in Impressions or in Data/Findings.
49	Hyperactivity	1, No: No interference indicated. 2, Yes: Comment relating to motor activity (lack of control of extraneous motor output, disinhibited behavior, extreme motor activity or fidgity).

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NEUROPSYCHOLOGICAL DATA (Card Number 02)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
49, Cont'd.	Cont'd.	9, No Data: No data available. 6, Other: Data available but an unclear picture.
50	Preferred Modality	1, Verbal, Part-for-Part Approach: Stated in Impressions. 2, Perceptual, Gestalt, Configural Approach: Stated in Impressions. 3, No Preference Noted: No indication of preferred modality in Impressions. 9, No Data: No data available.
51	General Memory Deficits	1, No: No indication of memory deficits in Impressions or in General Behavior Comments. 2, Yes: Any comment regarding memory deficits in Impressions or in General Behavior Comments. 9: No Data. No data available.

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NEUROLOGICAL DATA (Card Number 03)

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General Interpretation of Standard Scales for Neurology

(Unless otherwise noted more explicitly for specific items below)

01	Data Implied Significant Compromise	(Scale seldom used because of format of raw data)
02	Data Implied Some Compromise	(Scale seldom used because of format of raw data)
03	Data Implied Adequate	(No mention of compromise in neurological report)
04	Data Implied Some Strength	(Scale seldom used because of format of raw data)
05	Data Implied Significant Strength	(Scale seldom used because of format of raw data)
09	No Data	(No neurological data available)

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NEUROLOGICAL DATA (Card Number 03)

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General Interpretation of Standard Scales for Neurology

(Unless otherwise noted more explicitly for specific items below)

11	Reported Significant Compromise	(Mention of deficit in neurological report not qualified)
12	Reported Some Compromise	(Mention of words "slight," "subtle," or "some")
13	Reported Adequate	(Stated explicitly as appropriate in neurological report)
14	Reported Some Strength	(Stated explicitly as "area of strength")
15	Reported Significant Strength	(Stated explicitly as "area of significant strength")

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NEUROLOGICAL DATA (Card Number 03)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
1,2,3	Code Name	Pre-assigned and listed on outside of each folder
4,5	Card Number	03
6,7	Left Hemispheric Function	11: Mention of left hemispheric compromise in neurological report not qualified or statement that the left hemisphere is compromised more than the right hemisphere, when both are deficient. 12: Use of word "slight," "subtle" or "some" regarding left hemispheric compromise or statement that the left hemisphere is compromised less than the right hemisphere, when both are deficient. 13: Stated explicitly that there is no compromise of left hemispheric function. 03: No mention of left hemispheric compromise in neurological report.

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NEUROLOGICAL DATA (Card Number 03)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
8,9	Right Hemispheric Function	11: Mention of right hemispheric compromise in neurological report not qualified or statement that right hemisphere is compromised more than the left hemisphere, when both are deficient. 12: Use of word "slight," "subtle," or "some" regarding right hemispheric compromise or statement that the right hemisphere is compromised less than the left hemisphere, when both are deficient. 13: Stated explicitly that there is no compromise of right hemispheric function. 03: No mention of right hemispheric compromise in neurological report.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
10,11	Left Frontal Function	11: Explicit mention of left frontal compromise in neurological report, not qualified or of bifrontal compromise. (Left frontal problems were not implied from mention of left hemispheric problems.) 12: Use of word "slight," "subtle," or "some" regarding left frontal compromise or bifrontal compromise. 13: Stated explicitly that there is no compromise of left frontal or bifrontal function. 03: No mention of left frontal or bifrontal compromise in neurological report.

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NEUROLOGICAL DATA (Card Number 03)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
12, 13	Right Frontal Function	11: Explicit mention of right frontal compromise in neurological report, not qualified or of bifrontal compromise. (Right frontal problems were not implied from mention of right hemispheric problems.) 12: Use of word "slight," "subtle," or "some" regarding right frontal compromise or bifrontal compromise. 13: Stated explicitly that there is no compromise of right frontal or bifrontal compromise in neurological report.
14, 15	Hemispheric Integration	11: Explicit mention of hemispheric integration, midline, or corpus callosum problem in neurological report, not qualified. 12: Use of word "slight," "subtle," or "some" regarding problems in hemispheric integration.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
16, 17	Integration of Components	The General Interpretation is applicable.
18, 19	Organizational Functioning	The General Interpretation is applicable.
20, 21	Attentional Functioning	The General Interpretation is applicable.
22, 23	Sequencing Skills	The General Interpretation is applicable.
24, 25	Output/Production Skills	In the neurological report, this category refers to motor output. The General Interpretation is applicable.

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NEUROLOGICAL DATA (Card Number 03)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
26, 27	Speed of Response Functioning	In the neurological report, this category refers primarily to the speed of spontaneous responses as opposed to Timed Motor Tests. (Column 48, 49). The General Interpretation is applicable.
28, 29	Language Functioning	In the neurological report, this category refers primarily to spontaneous language as opposed to the more formal language testing. The General Interpretation is applicable.
30, 31	Perseveration Findings	The General Interpretation is applicable.
32, 33	Impulse Control	The General Interpretation is applicable.
34, 35	Initiating Behavior Findings	The General Interpretation is applicable.

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NEUROLOGICAL DATA (Card Number 03)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
36, 37	Sustaining Behavior Findings	The General Interpretation is applicable.
38, 39	Inhibiting Behavior Findings	The General Interpretation is applicable.
40, 41	Shifting Behavior Findings	The General Interpretation is applicable.
42, 43	Developmental (Maturity) Findings	The General Interpretation is applicable.

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NEUROLOGICAL DATA (Card Number 03)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
44,45	Perceptual Memory	The General Interpretation is applicable.
46,47	Linguistic Memory	The General Interpretation is applicable.
48,49	Speed Timed Motor Tests	The General Interpretation is applicable.
50, 51	Classical Neurological Findings	11: Explicit indication of such classical findings as seizure disorder, hemi-syndrome, tumor, or cerebral palsy. 13: Stated explicitly that there are no classical findings. 03: No mention of classical findings.

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NEUROLOGICAL DATA (Card Number 03)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
52	Hyperactivity	1, No: No mention of observed hyperactive behavior. 2, Yes: Mention of observed hyperactive behavior. 6, Other: Mention of symptoms typical of hyperactive child, but not observed. 9, No Data: No data available.
53	Handedness	1, Right: Explicit statement of right-handedness in the neurological report, not just in the writing task. 2, Left: Explicit statement of left-handedness in the neurological report, not just in the writing task.

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
53, Cont'd.	Cont'd.	3, Mixed: Explicit statement of mixed handedness. 9, No Data: No data available. Hand preference not mentioned.
54	Footedness	1, Right: Explicit statement of right foot preference in the neurological report. 2, Left: Explicit statement of left foot preference in the neurological report. 3, Mixed: Statement that neither foot is preferred over the other. 9, No Data: No data available. Foot preference not mentioned.

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NEUROLOGICAL DATA (Card Number 03)

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
55	Eyedness	1, Right: Explicit statement of right eye preference in the neurological report. 2, Left: Explicit statement of left eye preference in the neurological report. 3, Mixed: Statement that neither eye is preferred over the other. 9, No Data: No data available. Eye preference not mentioned.
56	Hyperactivity According to Connor's Rating Scale	1, No: Under 12 points excluding the L.D. item. 2, Yes: 12 points or over excluding the L.D. item. 9, No Data: No data available on Connor's Rating Scale.

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RATING MANUAL FOR CODING KEY FOR N.I.E. GRANT

MATHEMATICAL DATA (Cards 04, 05)

DATA BASE: Mathematics Diagnostic/Prescriptive Inventory
Raw Data Recording Forms

Mathematics Diagnostic/Prescriptive Inventory
Final Evaluation Reports

GENERAL INTERPRETATION OF STANDARD SCALES FOR MATHEMATICS

(Unless otherwise noted more explicitly for specific items below.)

01	Assumed No Competence	Items not administered because of accumulation of failures on prerequisite item(s). Failure on item assumed.
02	Assumed Significant Deficits	Item(s) not administered. (Coding rarely used.)
03	Assumed Some Deficits	Item(s) not administered. (Coding rarely used.)
04	Assumed Appropriate Responses	Item(s) not administered because they are beyond expectation for grade or because they are necessary prerequisites for an item(s) already satisfactorily achieved.
05	Assumed Better Than Expected	Item(s) not administered. (Coding rarely used.)
06	Assumed Area of Strength	Item(s) not administered. (Coding rarely used.)
09	No Basis for Assumption	Item(s) not administered, usually because of time restrictions.
11	Tested No Competence	Item(s) administered and failed.

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Rating Manual for Coding Key for N.I.E. Grant Mathematical Data (Cards 04, 05)

General Interpretation of Standard Scales for Mathematics, Cont'd.

(Unless otherwise noted more explicitly for specific items below.)

12 Tested Significant Deficits	Performance consistent with expectations two grades prior to given grade.
13 Tested Some Deficits	Performance consistent with expectations one year prior to given grade.
14 Tested Appropriate Responses	Performance appropriate for grade level.
15 Tested Better Than Expected	Performance consistent with expectations one grade beyond given grade.
16 Tested Area of Strength	Performance consistent with expectations two or more grades beyond given grade.
19 Tested But Data Obscure	Item(s) given but competence in it (them) obscure because of: • cognitive immaturity • behavioral interferences • diminished general cognitive level

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
1,2,3	Code Name	Pre-assigned and listed outside of each folder.					
4,5	Card Number	04					
6,7	Number Concepts: Summary	Average last digit of coding on items (8, 9), (10, 11), (12, 13), (14, 15), (20, 21) (22, 23). Score 1__ Average. Omit 09's, 19's.					
8,9	Counting Forward	Feb. GR. K-Jan. GR. 1	Feb. GR. 1-Jan. GR. 2	Feb. GR. 2-Jan. GR. 3	Feb. GR. 3-Jan. GR. 4	Feb. GR. 4-and Above	
		1 - 20 Counting on not required. Rhythm allowed.	1 - 50 Counting on required. One omission or repetition allowed if self-corrected.	1 - 100 Counting on required. One omission or repetition allowed if self-corrected.	1 → beyond 100. Counting on >100. One omission or repetition allowed if self-corrected.	1 → beyond 100. Counting on >100. No omissions.	Scored as 14.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
10, 11	Counting Backwards	Feb. GR. K-Jan. GR. 1	Feb. GR. 1-Jan. GR. 2	Feb. GR. 2-Jan. GR. 3	Feb. GR. 3-Jan. GR. 4	Feb. GR. 4-and Above	
		10 Down, Slowness allowed. No errors.	Counting backwards from numbers 10 - 20. Slowness allowed. No errors.	Counting backwards from numbers 30 - 40. Slowness allowed. One omission allowed.	Counting backwards from numbers 40 - 50. Automatic responses. One omission allowed.	Counting backwards from numbers 50 - 50. Automatic responses. No omissions allowed.	Scored as 14.
12, 13	Skip Counting	Not required.	10's → 100 5's → 30	10's → 110 5's → 105 Compensatory strategies allowed. Slowness allowed.	10's → 110 5's → 110 2's → 20 Automatic 10's from 7: Slowness and compensatory strategies allowed.	10's → 110 5's → 105 2's → 30 Automatic 10's from 7: No errors. Slowness and compensatory strategies allowed.	Scored as 14.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
14, 15	Concept of Quantity	Feb. GR. K-Jan. GR. 1	Feb. GR. 1-Jan. GR. 2	Feb. GR. 2-Jan. GR. 3	Feb. GR. 3-Jan. GR. 4	Feb. GR. 4-and Above	
		Gives 6 chips.	→	→	→	→	Scored as 14.
		Matches dot cards, not 5 x 5.	Matches all dot cards.	→	→	→	
		1:1 correspondence with chips.	1:1 correspondence with A-Blocks.	→	→	→	
		No conservation of number required.	→	Conservation of number required. Accuracy required.	→	→	
16, 17	Proficiency with Discrete Models	Shows 23 on place value task with all ones.	Shows 23 on place value task with blues and yellows on either first or second attempt.	Shows 23 on place value task with blues and yellows on first attempt.	→	→	Scored as 14.
		Modeling addition with chips.	→	→	→	→	

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. K- Jan. GR. 1	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- and Above	
18, 19	Proficiency with Continuous Models	Puts 10 rods in order. (Help may be given.) →	→	Puts 10 rods in order. No help. →	→	→	Scored as 14.
		Matches block with 7 whites. →	→	→	→	→	
			Finds value of blue. →	→	→	→	
			Shows 26 with longs and units on either first of second attempt.	Shows 26 with longs and units on first attempt. Can show another way. →	→	→	

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. K- Jan. GR. 1	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	
20,21	Place Value Concepts	Not required.	Uses 10's and 1's with either chips or rods.	Uses 10's and 1's in both chips and rods. Correct regrouping in +. →	→ → Correct regrouping in -. →	→ → → Alternate solution in one model required.	Scored as 14.
22,23	Order of Numbers	Recites sequences forward. →	→ Compares numbers. →	→ → Ordinality required. →	→ → →	→ → →	Scored as 14.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
24,25	Mathematics Symbolism: Summary	Average last digits of items (26, 27), (32, 33), (34, 35), (36, 37). Score = 1__ Average. Omit 09's, 19's.					
26,27	Whole Numbers	1 - 10 No errors.	1 - 50 No errors.	1 - 500 No errors.	1 - 1000 No errors.	1 - 10,000 No errors.	Scored as 14.
28,29	Reversals in Digits	Reversals allowed.	No reversals allowed.	→	→	→	Scored as 14.
30,31	Reversals of Place Values	Reversals allowed.	No reversals allowed in non-teen numbers.	No reversals allowed.	→	→	Scored as 14.
32,33	Fractional Numerals	Feb. GR. 3-Jan. GR. 4	Feb. GR. 4-Jan. GR. 5	Feb. GR. 5-Jan. GR. 6	Feb. GR. 6-Jan. GR. 7	Feb. GR. 7-Jan. GR. 8	Scored as 14.
		Reads 1/2, 1/3, 1/4.	Reads and writes 1/2, 1/3, 1/4.	Reads any fraction. Writes 1/2, 1/3, 1/4	Reads and writes any fractional numeral.	Reads and writes any fractional numerals or mixed numerals.	

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	Feb. GR. 7- Jan. GR. 8	Feb. GR. 8- Jan. GR. 9	Feb. GR. 9- Jan. GR.	
34,35	Decimals	Not required.	Reads tenths, hundredths.	Reads and writes tenths and hundredths.	Reads and ⟶ writes any decimal numeral.	⟶	Scored as 14.
		Feb. GR. K- Jan. GR. 1	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	
36,37	Operational Signs	Not required.	+, -, =	+, -, =	+, -, X, =	+, -, X, ÷, ⟌	Scored as 14.
38,39	Shapes	Not required.	Name and ⟶ draw: ○ □ △	⟶	⟶	⟶	Scored as 14.
40,41	Arithmetic: Summary	Average last digits of items (42, 43), (44, 45), (46, 47), (48, 49), (50, 51), (52, 53), (54, 55), (56, 57). Omit 09's, 19's. Score 1_ Average.					

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. K- Jan. GR. 1	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	
42,43	Addition Concepts	Demonstrates appreciation of joining.	Finds solutions for one-digit problems. Counters allowed.	→ Uses addition in applications.	→ →	→ →	Scored as 14.
44,45	Subtraction Concepts	Demonstrates appreciation a "taking away".	Finds solutions for one-digit problems.	→ Uses subtraction in applications.	→ →	→ →	Scored as 14.
		Feb. GR K- Jan. GR. 1	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2 Jan. GR. 3	Feb. GR. 3 Jan. GR. 4	Feb. GR. 4 Jan. GR. 5+	
46,47	Multiplication Concepts	Not required.	→	→	Demonstrates appreciation of X as repeated addition.	Finds solutions for one-digit problems.	Scored as 14.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7+	
48,49	Division Concepts	Not required.	→	Appreciates division as sharing or missing factor.	Finds solutions for one-digit divisors, no remainders.	Finds solutions for one-digit divisors with remainders.	Scored as 14.
		Feb. GR. K- Jan. GR. 1	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5+	
50,51	Addition Facts	Automatic responses not required.	4+1 2+3 } Rapid →	→	All one-digit solutions automatic. →	→	Scored as 14.
			6+8 8+7 } Deliberate compensatory strategies.	→			
			21+32 46+12 } Pencil and paper allowed	Can use facts in two-digit problems. One error.	Can use facts in two-digit problems. → No errors.	→	

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. K- Jan. GR. 1	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5+	
52,53	Subtraction Facts	Automatic responses not required.	6-2 12-1 } Rapid 9-7	→	→	→	Scored as 14.
			13-8: Deliberate	→	→	→	
			37-25: Deliberate	Uses facts in all two-digit work. One error.	Uses facts in all two-digit work. No errors.	→	
		Feb. GR. 2 Jan. GR. 3	Feb. GR. 3 Jan. GR. 4	Feb. GR. 4 Jan. GR. 5	Feb. GR. 5 Jan. GR. 6	Feb. GR. 6 Jan. Gr. 7+	
54,55	Multiplication Facts	Not required.	Factors less than 6.	All one-digit facts rapid.	→	→	Scored as 14.
					Use facts in two-digit work. →	→	

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7+	
56, 57	Division Facts	Not required.	Not required.	One-digit divisors. Deliberateness allowed.	One-digit divisors rapid	→ Use facts in two-digit procedures.	Scored as 14.
58,59	Compensatory Strategies in the Recall of Facts	No compensatory strategies required or compensatory strategies yield correct solutions with appropriate time constraints.					Scored as 14.
		Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	
60,61	Addition Without Regrouping	21 + 32 46 + 12 → Procedures rather than facts evaluated →	32 + 5 →				Scored as 14.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	
62,63	Addition With Regrouping	Not required.	35 + 16 = 47 + 8 = →		79 + 83 = →		Scored as 14.
		Procedures rather than facts evaluated. →					
64,65	Subtraction Without Regrouping	37 - 35 →					Scored as 14.
		Procedures rather than facts evaluated.					
66,67	Subtraction With Regrouping	Not required.	46 - 29 = →				Scored as 14.
		Procedures rather than facts evaluated. →					
		Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	
68,69	Multiplication With One-Digit Multiplier	Not required.	22 x 4 = →	41 x 4 = →			Scored as 14.
		Procedures rather than facts evaluated →					

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MATHEMATICAL DATA (Card 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	
70,71	Multiplication With Two-Digit Multiplier	Not required.	14 x 10 = →	→	→	→	Scored as 14.
				16 x 11 36 x 42 →	→	→	
		Procedures rather than facts evaluated →				→	
72,73	Division With One-Digit Divisor	Not required.	Not required.	18 ÷ 2 →	→	→	Scored as 14.
				$4\overline{)12}$			
				$3\overline{)69}$ Familiar.	$3\overline{)69}$ →	→	
				Not established.	$3\overline{)90}$		
		Procedures rather than facts evaluated. →				→	

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MATHEMATICAL DATA (Card 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	Feb. GR. 7- Jan. GR. 8	
74,75	Division With Two-Digit Divisor	Not required.	Not required.	$12\overline{)144}$ $36\overline{)215}$ Familiar, some error.	$36\overline{)215}$ →	→	Scored as 14.
		Procedure rather than facts evaluated →				→	
76,77	Addition of Fractions With Same Denominators	Not required.	Solutions found using manipulatives or role "reape." Understanding limited.	Can solve and understand. → Can relate arithmetic to a model.	→	Mastery of abstract algorithm.	Scored as 14.

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MATHEMATICAL DATA (Card 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 3-Jan. GR. 4	Feb. GR. 4-Jan. GR. 5	Feb. GR. 5-Jan. GR. 6	Feb. GR. 6-Jan. GR. 7	Feb. GR. 7-Jan. GR. 8	
78,79	Addition of Fractions With Different Denominators	Not required.	Not required.	Solution using manipulative materials or by "reapé." Little understanding.	Solutions found and understood. Can relate to a model.	→	Scored as 14.
80	Money	Recognizes coins.	→	→	→	→	Scored as Yes.
		Knows values in pennies.	→	→	→	→	
			Knows values in various ways.	→	→	→	
			Can create a given value with a combination of coins.	→	→	→	
				Can make change.	→	→	
		Too young for expectation.					6

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
1,2,3	Code Name	Pre-assigned and listed outside each folder.					
4,5	Card Number	05					
		Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	Feb. GR. 7- Jan. GR. 8	Feb. GR. 8- Jan. GR. 9	
6,7	Subtraction of Fractions With Same Denominators	Solution using manipulatives or "recipes." Little understanding.	→	Solutions achieved and understood. Can relate to a model.	→	→	Scored as 14.
8,9	Subtraction of Fractions With Different Denominators	Attempt to find L.C.D. and initiate procedures. Solution not necessary.	Attempt to find L.C.D. and initiate procedures. Achieves some solution, not necessarily accurate.	Finds L.C.D. and accurate solution. Can relate to model.	→	→	Scored as 14.

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MATHEMATICAL DATA (Card 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	Feb. GR. 7- Jan. GR. 8	Feb. GR. 8- Jan. GR. 9	
10,11	Multiplication of Fractions Without Cancellation	Not required.	Not required.	Solution found. May need reminder of X , not +.	Solution found →	→	Scored as 14.
		Feb. GR. 6- Jan. GR. 7	Feb. GR. 7- Jan. GR. 8	Feb. GR. 8- Jan. GR. 9	Feb. GR. 9- Jan. GR. 10	Feb. GR. 10- Jan. GR. 11	
12,13	Multiplication With Cancellation	Not required.	Solution found. →	→	→	→	Scored as 14.
14,15	Division of Fractions	Not required.	Solution found. Cancellation not required. →	→	→	→	Scored as 14.
16,17	Addition of Decimals	Solution found by recipe.	Solution found and understood. →	→	→	→	Scored as 14.

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MATHEMATICAL DATA (Card 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 6 - Jan. GR. 7	Feb. GR. 7 - Jan. GR. 8	Feb. GR. 8 - Jan. GR. 9	Feb. GR. 9 - Jan. GR. 10	Feb. GR. 10 - Jan. GR. 11	
18, 19	Subtraction of Decimals	Solution found by recipe.	Solution found and understood. →	→	→	→	Scored as 14.
20, 21	Multiplication of Decimals	Not required.	Solution found by recipe.	Solution found and understood. →	→	→	Scored as 14.
22, 23	Division of Decimals	Not required.	Solution found by recipe.	Solution found and understood. →	→	→	Scored as 14.
		Feb. GR. 4 - Jan. GR. 5	Feb. GR. 5 - Jan. GR. 6	Feb. GR. 6 - Jan. GR. 7	Feb. GR. 7 - Jan. GR. 8	Feb. GR. 8 - Jan. GR. 9	
24, 25	Mental Arithmetic	Attempts portions of two-digit problems mentally.	→	Performs serial mental calculations without paper and pencil. →	→	→	Scored as 14.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
		Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	Feb. GR. 7- Jan. GR. 8	Feb. GR. 8- Jan. GR. 9	
26, 27	Estimation Skills	Generally not administered.					Scored as 09.
28, 29	Concept of Integers	Not required.	→	→	→ Relates integers to some model.	Solutions for +, -, X, ÷.	Scored as 14.
30, 31	Procedures With Integers	Not required.	→	→	→	Solutions for +, -, X, ÷.	Scored as 14.
32, 33	Algebra Skills	End of Algebra I:		Procedures with integers Simplification Evaluation Solution to linear equations Expand binomials Initial factoring of trinomials			Scored as 14.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA	
34,35	Geometry: Summary	Average last digits (36, 37), (44, 45), (46, 47), (48, 49). Omit 09's, 19's. Code = 1__ Average.	
		Feb. GR. 2- Jan. GR. 3 · Feb. GR. 3- Jan. GR. 4 · Feb. GR. 4- Jan. GR. 5+	
36,37	Figure/Ground Discrimination	Moon/Star Achieved. ⟶ Outlines star from multi-star diagram.	Scored as 14.
38,39	Appreciation of Detail	Can identify pieces required in visual memory activities and/or Can identify components of figures portrayed on geoboard.	Scored as 14.
40,41	Appreciation of Overall Configuration	Describes overall design as an acceptable real-life model. Makes a design in same class as given design, e.g. any triangle. Gestures generally to indicate overall outline.	Scored as 14.

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MATHEMATICAL DATA (Card 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA					
42,43	Organizational Skills in Geometry	Visual Memory Activities:					
		Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6+	
		3 designs correct.	4 designs correct.	5 designs correct.	5 designs correct.	6 designs correct.	Scored as 14.
		On geoboard, pursues reasonable strategy. No reflections or rotations of figures.					
44,45	Geoboard Activities	Can make, enlarge shapes. Can find areas of regions. Administered only to Grades 3 or higher.					Scored as 14.
		Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4 - Jan. GR. 5+		
46,47	Perceptual Imagination/ Judgment	Can order Cuisenaire rods. →	→	→	→	→	Scored as 14.
			Achieves relative proportionality of parts and overall figures. →	→	→	→	
					Can interpret 3-D cube designs.		

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA			
48,49	Three-Dimensional Figures	Given only to Grades 5 or higher. Sees three dimensions. Integrates three dimensions effectively. Formulates a strategy for solutions.			Scored as 14.
50,51	Geometric Problem Solving	Feb. GR. 3– Jan. GR. 4+ } Can find at least 22 squares			Scored as 14.
52,53	Problem Solving Intuitions and Strategies: Summary	Average last digits of (50, 51), (54, 55), (56, 57), (58, 59), (60, 61), (62, 63), (64, 65), (66, 67), (68, 69), (70, 71). Omit 09's and 19's. Score: 1_ Average.			Scored as 14.
54,55	Pictorial Graphs	Feb. GR. 1– Jan. GR. 2	Feb. GR. 2– Jan. GR. 3+		
		Success on fruit and family graphs.	Success on all graph activities.		

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA						
56,57	Application to Real Life Situations	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6+		
		Success on VIII-B: #1,2,3,4 →	→ Success on VIII-B: #7 →	→ →	Success on VIII-B: #1-4,5 →	Success on VIII-B: #1-6 →	Scored as 14.	
58,59	Analogies	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6+			
		VIII-C: #1-3	VIII-C: #1-4	VIII-C: #1-5	VIII-C: #1-6		Scored as 14.	
60,61	Sequences	Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	
		VIII-D: #1-8	VIII-D: #1-9	VIII-D: #1-9	VIII-D: #1-10	VIII-D: #1-13	VIII-D: #1-14	Scored as 14.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA						
		Feb. GR. 4- Jan. GR. 5	Feb. GR. 5- Jan. GR. 6	Feb. GR. 6- Jan. GR. 7	Feb. GR. 7- Jan. GR. 8	Feb. GR. 8+		
62,63	Intuitive Functions	VIII-E: a-c	VIII-E: a-d	VIII-E: a-d, f Scored as 15:e	VIII-E: a-d, f, g → Scored as 15:e,h	→		Scored as 14.
		Feb. GR. 1- Jan. GR. 2	Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5+			
64,65	Word Problems	VIII-F: a	VIII-F: a,c	VIII-F: a,c b: one solution	VIII-F: a,c b: two solutions			Scored as 14.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA				
		Feb. GR. 2- Jan. GR. 3	Feb. GR. 3- Jan. GR. 4	Feb. GR. 4- Jan. GR. 5+		
66,67	Attributes of Sets: Creature Cards	VIII-G: a,b	VIII-G: a,b,c	a,b,c,d		Scored as 14.
68,69	Logic	Insufficient Data. Scored as 9.				
70,71	Arithmetic Problem Solving	Insufficient Data. Scored as 9.				

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
72,73	Achievement at Grade Level	Average of coding on items: Card 04: (6, 7), (24, 25), (40, 41). Omit 09's and 19's. Score: 1__ Average.
74,75	Developmental (Maturity) Findings	Characteristics noted: • no conservation of number • no conservation of length • no one-to-one correspondence • no concept of +, - • no place value concepts • build in 3 dimensions • egotistical problem solving approaches • problems with abstraction 11: Seldom used. 12: 3 or more characteristics noted. 13: 1-2 characteristics noted.
76,77	Overall "Math Sense"	Average of coding on Card 06: (50, 51) and 2 times (52, 53). Omit 09's and 19's. Score: 1__ Average.

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MATHEMATICAL DATA (Cards 04, 05)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
78,79	Sustaining Behavior	Comments: "problems with oral counting sequences" "impersistent" "difficulty maintaining procedure" "difficulty with iterative processes" "problems sustaining..." 11: Seldom used. 12: 2 or more comments. 13: 1 comment.
80	Attention to Detail	1: No 2: Yes • Can proceed through arithmetic calculations. • Correctly orients figures. • Includes salient components. • In word problem, attends to correct elements. 6: Conflicting Data or Individual Too Young to Expect Competence. 9: No Data.

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MATHEMATICS FINDINGS (Card Number 06)

DATA BASE: Mathematics Diagnostic/Prescriptive Inventory
Raw Data Recording Forms

Mathematics Diagnostic/Prescriptive Inventory
Final Evaluation Reports

GENERAL INTERPRETATION OF STANDARD SCALES FOR MATHEMATICS

(Unless otherwise noted more explicitly for specific items below.)

01	Assumed No Competence	Items not administered because of accumulation of failures on prerequisite item(s). Failure on item assumed.
02	Assumed Significant Deficits	Item(s) not administered. (Coding rarely used.)
03	Assumed Some Deficits	Item(s) not administered. (Coding rarely used.)
04	Assumed Appropriate Responses	Item(s) not administered because they are beyond expectation for grade or because they are necessary prerequisites for an item(s) already satisfactorily achieved.
05	Assumed Better Than Expected	Item(s) not administered. (Coding rarely used.)
06	Assumed Area of Strength	Item(s) not administered. (Coding rarely used.)
09	No Basis for Assumption	Item(s) not administered, usually because of time restrictions.
11	Tested No Competence	Item(s) administered and failed.

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General Interpretation of Standard Scales for Mathematics, Cont'd.

(Unless otherwise noted more explicitly for specific items below.)

12	Tested Significant Deficits	Performance consistent with expectations more than one year prior to given grade level of student.
13	Tested Some Deficits	Performance consistent with expectations one year prior to given grade level of student.
14	Tested Appropriate Responses	Performance appropriate for grade level.
15	Tested Better Than Expected	Performance consistent with expectations one year beyond grade level of student.
16	Tested Area of Strength	Performance consistent with expectations two or more years beyond grade level of student.
19	Tested But Data Obscure	Item(s) given but competence in it (them) obscured because of • cognitive immaturity • behavioral interferences • diminished general cognitive level

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
1,2,3	Code Name	Pre-assigned and listed outside of each folder.
4,5	Card Number	06
6,7	Anticipated Math Growth	11: Seldom used. 12: "At risk" assigned if specified: • "at risk" • weak place value • weak numerical symbolism • maturity issues - conservation of number - 1:1 correspondence - concept of quantity - concept of combining sets
8,9	Memory Skills: Summary	Areas of possible deficits: • recall of arithmetic facts • recall of multi-step procedures • recall of mathematical components of situations • recall of directions • visual memory 11: 5 areas of deficits. 12: 2-4 areas of deficits. 13: 1 area of deficit. 14: No deficits reported. 15,16: Seldom used.

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA	
10, 11	Memory of Arithmetic Facts	11:	Seldom used.
		12:	General mention of deficits in more than one operation.
		13:	Deficits in only one operation or deficits adequately compensated for by compensatory strategies.
		14:	Automatic recall demonstrated.
		15, 16:	Seldom used.
12, 13	Memory for Multi-Step Procedures	11:	No skill demonstrated when teaching of that skill has been reported.
		12:	Deficits in +, − with regrouping X, ÷ with one-digit multiplier, divisor
		13:	Deficits in longer procedures, X with multi-digit multiplier, ÷ procedures with multi-digit divisors.
		14:	Steps of procedure recalled appropriately.
14, 15	Memory of Directions	11:	Seldom used.
		12:	Multiple repetitions requested.
		13:	Reauditorization used after one request for repetition.
		14:	No request for repetitions. Reauditorization allowed.

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
16, 17	Memory for Pertinent Math Data	In the following activities: • dictated arithmetic problems • word problems • math applications 11: Each element must be repeated several times, presented singly, in a careful order. 12: Multiple elements omitted. 13: Some elements omitted. 14: Can proceed independently. No repetition of elements.
18, 19	Visual Memory	In • visual memory activities • geoboard activities • arithmetic activities 11: Cannot proceed if stimulus is shielded. 12: Needs multiple opportunities to view stimulus or shows deficits in producing outline of design and in including all components. 13: Needs a few opportunities to view stimulus or shows deficits in producing outlines of design or in including all components or deficits only in complex designs. 14: No need for extra time or opportunities to view stimulus; appropriate and correct responses.

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
20, 21	Self-Image	Comments: "needs encouragement" "low self-esteem" "lacks confidence" "super vigilant" "needs prodding to continue" 11: Seldom used. 12: 2 or more of above comments. 13: 1 of above comments. 14: None of above comments mentioned.
22, 23	Spontaneous Self-Structuring	Comments: "needs encouragement to proceed" "needs cueing to proceed" "examiner provides strong, external support" 11: Seldom used. 12: 2 or more of above comments or comment made strongly. 13: Some mention of comment.

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
24,25	Deliberateness	Comments: "slow" "impulsive" "slow due to facts" "slow processing" "slow initiating" 11: Seldom used. 12: 2 or more of above comments or comment made more strongly. 13: 1 of above comments or slowness due only to problems using facts in arithmetic procedures.
26,27	Initiation of Responses	Comments: "impulsive" "slow initiating" "needs encouragement to start" "hesitant" 11: Seldom used. 12: 2 or more of above comments or comment made more strongly. 13: 1 of above comments.

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
28,29	Implementation of Responses	Comments: "deliberate" "rushes" "slow processing" "hesitant integrating" "needs encouragement to proceed" 11: Seldom used. 12: 2 or more of above comments or comment made strongly. 13: One of above comments.
30,31	Production of Responses	Comments: "handwriting troublesome" "slow organizing responses" "needs strong external structuring to respond" "needs encouragement to respond" 11: Seldom used. 12: 2 or more of above comments or comment made strongly. 13: 1 of above comments.

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
32,33	Organizational Skills	Deficits noted in • Visual memory tasks: organizing components effectively. • Geoboard activities: positioning figures, components of figures. • Dictated arithmetic activities: organization of elements. • Arithmetic procedures: organization of written work or steps in procedure. • Numerical symbols: reversals noted. 11: Seldom used. 12: Deficits in two or more areas. 13: Deficits in one area.
34,35	Integration of Multi-Step Procedures	Deficits noted in arithmetic procedures. General Interpretation of Standard Scales applies.
36,37	Precision of Responses	Comments: "careless errors" "problems with operations signs" 11: Seldom used. 12: Several careless errors noted. 13: Some careless errors noted.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
38,39	Attentional Functioning	Comments: "needs strong examiner structure" "difficulty focussing" "difficulty attending . . . 11: Seldom used. 12: Several repeated and/or strong comments. 13: "Tendency toward inattention" or "Attention can be harnessed in a 1:1 situation".
40,41	Ability to Learn New Skills/Procedures	Often not evaluated.
42	Need for Manipulative Materials	1: No: Individual can proceed without manipulative materials. 2: Yes: Manipulatives essential, especially if evidence of past failures without them. 6: Other: Any comment not covered above.
43	Need for Reauditorization Techniques	1: No: No reauditorization noted. 2: Yes: Reauditorization noted any time in the evaluation. 6: Other: Any comment not covered above.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
44	Impulsivity	Comments: "premium put on speed" "impulsive" 1: No: Comment 2: Yes: Some Comment 6: Other: Any comment not covered above.
45	Perseveration	1: No: Comment 2: Yes: Some comment 6: Other: Any designation not covered above.
46	Ability to Respond to Complexity	1: No: Difficulty noted. Confusion in higher level tasks. 2: Yes: More difficult tasks attempted and pursued. 6: Other: Conflicting data or individual too young to expect competence. 9: No Data

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
47	Diversity in Approaches	1: No 2: Yes • Multiple approaches to arithmetic problems. • Good compensatory strategies in presence of recall deficits. • Can give alternate solutions or approaches when requested. 6: Other: Conflicting data or individual too young to expect competence. 9: No Data
48	Flexibility in Approaches	1: No 2: Yes: Can give alternate approaches or solutions spontaneously or when asked. 6: Other: Conflicting data or individual too young to expect competence. 9: No Data.
49	Recognition of Pertinent Math Data	1: No 2: Yes: Can identify salient data in word problems and real life applications. 6: Other: Conflicting data or individual too young to expect competence. 9: No Data.

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
50	Learning Style I Operative	1: No 2: Yes • Can approach any number situation effectively. • Can recognize salient details. 6: Conflicting data or individual too young to expect competence. 9: No Data.
51	Learning Style II Operative	1: No 2: Yes • Can approach geometric activities effectively. • Appreciative of overall thrust. 6: Conflicting data or individual too young to expect competence. 9: No Data.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
52	Learning Style I Preferred	1: No 2: Yes • Prefers chip model for number. • Emphasis on details. • Part-for-part, serial strategies preferred. • Approaches geometric configurations through their components. • Better performance with geoboard than blocks. • Counting on strategies for arithmetic facts. • Better at sequences than analogies. 6: Other: Conflicting data or individual too young to expect competence. 9: No Data.
53	Learning Style II Preferred	1: No 2: Yes • Prefers rod models for number. • Emphasis on overall thrust, general perspective. • Global strategies. • Assimilation of parallel considerations - in facts - in problem solving • Approaches geometric configurations through their overall shape. • Better performance with blocks than geoboard. • Better at analogies than sequences.

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COLUMNS	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
53, Cont'd.	Learning Style II Preferred	6: Conflicting data or individual too young to expect competence. 9: No Data.
54	Learning Style I Impaired	1: No 2: Yes • Deficits in precision of details, arithmetic solutions. • Difficulty pursuing multi-step procedures. • Overlooks salient details. • Overwhelmed with details. 6: Conflicting data or individual too young to expect competence. 9: No Data.
55	Learning Style II Impaired	1: No 2: Yes • Deficits in perceptual judgment. • Prefers geometric activities. • Difficulty estimating answer, recognizing inappropriate solutions. • Cannot initiate or choose appropriate strategy in applications or word problems.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
55 (Cont'd.)	Learning Style II Impaired, (Cont'd.)	• Problems with fraction concepts. • Confusion when generalities are involved. 6: Conflicting data or individual too young to expect competence. 9: No Data.
56	Behavioral Considerations	1: No: No interference noted. 2: Yes: Behavioral postures interfere with performance. 6: Conflicting data or individual too young to expect competence. 9: No Data.
57	Need for Extraneous Pysical Activity	1: No 2: Yes 6: Conflicting data or individual too young to expect competence. 9: No Data.
58	Need for Extraneous Conversation	1: No 2: Yes 6: Conflicting data or individual too young to expect competence.

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
	The following items were reported in the "Recommendations" sections of the Mathematics Diagnostic/Prescriptive Inventory: Final Evaluations Reports. GENERAL INTERPRETATION OF CODES (Unless otherwise noted more explicitly for specific items below.) 1: No Recommendation not required. 2: Yes Recommendation required. 9: No No basis for judgment.	

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MATHEMATICS FINDINGS (Card Number 06)

COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
59	Recommendations: Remediation Program	1: No 2: Yes 9: No Data
60	Recommendations: in Regular Classroom	1: No 2: Yes 9: No Data
61	Recommendations: Outside Regular Classroom	1: No 2: Yes 9: No Data
62	Recommendations: On Individual (One-to-One Basis)	1: No 2: Yes or in samll group for all instruction. 9: No Data _
63	Recommendations: Supportive Program	1: No 2: Yes 9: No Data

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
64	Recommendations: Supportive Program in Regular Classroom	1: No 2: Yes 9: No Data
65	Recommendations: Supportive Program Outside Regular Classroom	1: No 2: Yes 9: No Data
66	Recommendations: Supportive Program On Individual (One-to-One) Basis	1: No 2: Yes 9: No Data
67	Recommendations: Use of Discrete Models	1: No 2: Yes 9: No Data
68	Recommendations: Use of Continuous Model	1: No 2: Yes 9: No Data

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
69	Provision of Step-by-Step/"Recipe" Approaches	1: No 2: Yes 9: No Data
70	Provision of Estimation/ "Preview" Approaches	1: No 2: Yes 9: No Data
71	Provision of Strong External Structuring	1: No 2: Yes 9: No Data
72	Relaxation of Time Constraints	1: No 2: Yes 9: No Data
73	Recommendation: Development of Compensatory Strategies for Recall Deficits	1: No 2: Yes: If needed or if already used. 3: No Data

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
74	Provision of Calculator	1: No 2: Yes 9: No Data
75	Recommendation: Experiental Math Program	1: No 2: Yes 9: No Data
76	Recommendation: Math Program Determined by Life's Goals	1: No 2: Yes 9: No Data
77	Recommendation: Close Follow-up Evaluation (6 mos. - 1 yr.)	1: No 2: Yes 9: No Data
78-79	Language Interference	Deficits: • in general conversation • in word problems • in real life applications • with directions • long latencies

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COLUMN	ITEM DESCRIPTION	DATA BASE AND/OR CRITERIA
78,79 (Cont'd.)	Language Interference, (Cont'd.)	11: Seldom used. 12: Several comments or unqualified description of deficits. 13: If deficits described as "subtle".
80	Perceptual Judgment	1: No 2: Yes: Problems selecting or building shapes with correct dimensions or proportionality. 9: No Data